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MARCH CONTENTS 1944

THE CLINICAL ASPECTS OF TRAUMATIC EPILEPSY. *D. Denny-Brown* 585

THE EFFECT OF INTRAFAMILY DISCORD ON THE PROGNOSIS OF EPILEPSY. *Jerry C. Price and Tracy J. Putnam* 593

GENETIC AND ENVIRONMENTAL FACTORS IN PSYCHOSES OF CHILDREN. *Edgar C. Yerbury and Nancy Newell* 599

THE PSYCHIATRIC ASPECT OF TESTAMENTARY CAPACITY. *Gustav Aschaffenburg* 606

AN APPARATUS FOR THE USE OF BREATH SOUNDS AS A HYPNAGOGIC STIMULUS. *Lawrence S. Kubie and Sydney Margolin* 610

THE PROCESS OF HYPNOTISM AND THE NATURE OF THE HYPNOTIC STATE. *Lawrence S. Kubie and Sydney Margolin* 611

REPORT OF A SURVEY OF NURSING IN MENTAL HOSPITALS IN THE U. S. AND CANADA. *Laura Fitzsimmons* 623

THE FREQUENCY AND SIGNIFICANCE OF A MOVEMENT MANNERISM FOR THE MILITARY PSYCHIATRIST. *Lt. L. A. Pennington and Lt. R. J. Mearin* 628

FATAL CATATONIA. *Otto Billig and W. T. Freeman* 633

WAYS OF THINKING IN BRAIN-CRIPPLED DEFICIENT CHILDREN. *Alfred A. Strauss* 639

THE OXYGEN CONTENT OF CEREBRAL BLOOD IN PATIENTS WITH ACUTE SYMPTOMATIC PSYCHOSES AND ACUTE DESTRUCTIVE BRAIN LESIONS. *Harold E. Himwich and Joseph F. Fazekas* 648

VARIATIONS IN THE GLUCOSE TOLERANCE OBSERVATIONS IN SCHIZOPHRENICS BEFORE AND AFTER SHOCK TREATMENT. *Lorne D. Proctor, John G. Dewan, and Burdett H. McNeel* .. 652

THE EFFECT OF PLEASANT AND UNPLEASANT IDEAS ON THE RESPIRATORY PATTERN (SPIROGRAM) IN PSYCHONEUROTIC PATIENTS. *Jacob E. Finesinger* 659

THE ELECTROSHOCK CONVULSION SYNDROME. *Paul H. Wilcox* 668

THE MECHANISM OF THE INSULIN EFFECT ON ABNORMAL BEHAVIOR. *Bernard F. Riess and Louis Berman* 674

ANOREXIA NERVOSA: METABOLISM AND ITS RELATION TO PSYCHOPATHOLOGIC REACTIONS. *S. M. Small and A. T. Milhorat* 681

THE INCIDENCE OF NOCTURNAL ENURESIS AFTER AGE FIVE. *Frederick C. Thorne* 686

PHILADELPHIA AND PSYCHIATRY, 1944 690

CLINICAL NOTES:

A Note on the Incidence of Rheumatic Heart Disease among Criminal Psychopaths, 708. New Headpiece for Electric Shock Therapy, 709.

COMMENT:

Mental Hygiene Developments in Virginia, 710. Bernard Sachs 711

NEWS AND NOTES:

Royal Medico-Psychological Association, 713. Michigan Society of Neurology and Psychiatry, 713. Boston Psychoanalytic Society, 713. Dietetic Course at Colorado State Hospital, 714. Dr. Arnillas' Mission to Chile and the Argentine, 714. Association for Research in Nervous and Mental Disease, 714. The Psychiatric Educational Society, Berkeley, Cal., 714. Course in Rorschach Test, 714. Opening for Psychiatric Social Workers, 714. National Vocational Rehabilitation, 715. Position Child in Psychiatry Available, 715.

SAFEGUARDING MILITARY INFORMATION 715

BOOK REVIEWS:

Mind, Medicine and Man. *Gregory Zilboorg* 716
Roots of Bergson's Philosophy. *Ben-Ami Scharfstein* 717
Introduction to Psychiatry. *W. Earl Biddle and Mildred Van Sickel* 717
Introduction to Group Therapy. *S. R. Slavson* 718
Lewin's Topical and Vector Psychology. *Robert H. Leeper* 718
Counseling and Psychotherapy. *Carl R. Rogers* 719
Convulsive Seizures. *Tracy Putnam* 720
A Handbook of Psychiatry. *P. M. Lichtenstein and S. M. Small* 720
Principles and Practice of Rehabilitation. *John Eisele Davis* 720
Neurology. *Roy R. Grinker* 721
Infant and Child in the Culture of Today. *Arnold Gesell and Frances L. Ilg* 721
The Vertebrate Eye and Its Adaptive Radiation. *Gordon Lynn Walls* 721
Esquizofrenia. Carlos R. Pereyra 722

IN MEMORIAM:

Colonel Roy Dennis Halloran. *Malcolm J. Farrell* 723
Philip Smith. *Frederick W. Parsons* 724

PRELIMINARY PROGRAM. Centennial Meeting of the American Psychiatric Association 726

THE CLINICAL ASPECTS OF TRAUMATIC EPILEPSY [1]

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Of all the difficult questions surrounding the problem of traumatic epilepsy, the most difficult is the simple statistical estimate of its frequency. Figures given vary from 49 per cent to one per thousand cases of head injury. Even in supposedly closely comparable material in military head injuries in the World War 1914-18, the studies of Stevenson(1), Sargent(2), Rawling(3), Wagstaffe(4), record estimates of 1.5 per cent, 4.5 per cent, 10 per cent and 25 per cent respectively. This wide variation is in part due to selection, and it will be noted that the low figures are from a series of 17,300 and 18,000 cases, while those of Rawling(3) and Wagstaffe(4) are from a smaller series of 425 and 377 cases, in each case the follow-up of an individual surgeon. It is apparent that much depends on what one means by head injury; what cases are counted as remaining free from epilepsy. At one extreme is the objection that the experience of an operating military surgeon would include only severe head injury, often with laceration of the brain, at the other is the fact that one investigator can hardly scrutinize such a large mass of material as 17,000 or 18,000 cases. Garland(5) has indicated also that there is the factor that less severe cases had their claims settled early (7600 by 1923).

To overcome these objections my colleague, Major Ascroft(6), took a random sample of one record from each file of some 26,000 British pension head injury records from the last World War. Five hundred and forty case records of gunshot wounds of the head obtained in this way were carefully examined. No less than 223 had to be discarded because of inadequate data relating to the head injury, or because the injury was related to the cerebellum, or other part not pertinent to the injury. Of the remaining 317 cases, 34 per cent suffered from epilepsy.

It is clear therefore that we should understand what we mean when we speak of incidence of epilepsy in head injury. Is it worth while to consider epilepsy in relation to all skull injury, that is face, jaw or base of skull? It appears reasonable that in this question we should define head injury to mean such injury to the skull as might directly or indirectly cause damage to the brain. The author would include cases of scalp injury, even where there was no concussion (immediate loss of consciousness) because such injuries may well cause brain damage by indirect means, for example, by subdural abscess or hematoma.

In this analysis of British war pensioners Ascroft(6) found that epilepsy was twice as frequent (45 per cent) in cases where the dura was penetrated by gunshot wound, as in scalp and skull wounds with intact dura (23 per cent). Scalp wounds due to missiles were more likely to be followed by epilepsy than scalp wounds due to blunt injury. The presence or absence of concussion (immediate loss of consciousness) did not alter the liability to epilepsy. These figures indicate clearly that it is a *localized injury* to the brain which carries a high liability to epilepsy, a much higher liability if dural laceration is involved in the localized brain damage. In contrast concussion is an effect of a *generalized* physical disturbance of the brain; an event of different order from contusion or laceration.

The importance of injury to the dura had also been appreciated by Sargent(2) and by Foerster and Penfield(7), and had been clearly demonstrated in an excellent analysis of gunshot wound material from the last World War by Credner(8) in 1930. The series of this author numbered 1980 cases with at least five years follow-up, 331 for more than ten years. She states explicitly that these are all serious head injuries, and excludes those with loss of consciousness of brief duration and without

[1] Read at the ninety-ninth annual meeting of The American Psychiatric Association, Detroit, Michigan, May 10-13, 1943.

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neurological findings. Of the whole group 755 or 38.2 per cent became epileptic. They were classified as follows:

1. Open brain injuries (dural wound) 1234 cases—49.5 per cent epileptic.
2. Skull injuries without brain damage 417 cases—20.3 per cent epileptic.
3. Cases in which extent of initial injury were vague.
4. Brain injury without skull injury (blunt injury) 244 cases—19.7 per cent epileptic.
5. Cases of traumatic blindness and deafness 85 cases, 6 per cent epileptic.

Credner(8) found the incidence highest in parietal lesions, next highest in frontal. Ascroft(6) found it highest in rolandic lesions, next temporal, then parietal. The statistics of Credner closely parallel those of Ascroft, and the material from which they are drawn is closely similar. It may be noted in comparison of Credner's groups 2 and 4 how clearly the figures show that fracture of the skull is without importance in the question of epilepsy.

All these figures however give a false impression of the relationship of epilepsy to head injury in general, for it is common experience that the incidence of epilepsy in the head injuries seen in civil practice is very much less. How much less is indicated clearly by Schou(9), Russell(10), Rowbotham(12) and Feinberg(11). Schou found 4.5 per cent of epilepsy in 200 cases of head injury reported to a Danish insurance company, Russell 3.5 per cent in 200 cases of civilian head injury, and Rowbotham 2.5 per cent in 450 cases. Feinberg(11) found 50 cases of traumatic epilepsy in 47,130 cases of head injury reported to a Swiss insurance company (Suval) over a period of 14 years, approximately 0.1 per cent. Here obviously the background is of all types of head injury. Fracture of the skull, for instance, is relatively infrequent (8.2 per cent) in Feinberg's series of head injuries, whereas in Credner's(8) war series it has occurred in 83.0 per cent. In the civilian series traumatic epilepsy occurred in 5 per 1000 of cases with fracture of the skull, in 1.25 per 1000 of cases with concussion without fracture. Since in other series fracture of the skull is not of particular significance this difference indicates only that cases with fractures include more of the severe injuries. There is no doubt that epilepsy can follow "blunt" civilian head injury without fracture, a point also stressed by Symonds(13).

The unusually low incidence found by Feinberg(11) has been criticized (Garland(5) 1942) on the ground that idiopathic epilepsy alone occurs more frequently in the general population. Feinberg's figures however give the cases of traumatic epilepsy after deduction of cases of epilepsy of other kinds (70 cases) and further allowance must be made for the fact that idiopathic epileptics with early onset of fits would not have been insured by the company. The series of Feinberg is therefore by far the largest unselected group of civil head injury, and the best figure we have at present for such a group.

The *effect of a foreign body* in the brain is an interesting one and particularly pertinent at the present time. Here however purely statistical evidence develops its greatest contradictions. The statistics of Ascroft(6) show that epilepsy was more frequent (53 per cent) when metal had been removed from the brain, than when it was not (38 per cent). Credner's figures(8) show epilepsy in 33 per cent of cases with bone fragments left *in situ*, in 45 per cent of cases where bone fragments were removed by operation. Operative interference, *per se*, might therefore appear to increase the risk of epilepsy. As Ascroft points out, however, such a deduction is fallacious. Operative removal would be predominantly of the larger fragments more superficially located, and this in turn implies just those cases with greatest cortical damage and more liability to sepsis. The figures do demonstrate that the presence of fragments does not in fact increase the liability to epilepsy above the average. All investigators agree that *wound sepsis* operates very strongly in favor of epilepsy (*e.g.*, 63 per cent incidence—Credner).

The statistical data of the author is meagre, being on 53 cases (16 focal fits, 37 generalized) out of 630 fully documented head injuries seen in a special military hospital in England (Denny-Brown(14)). The ma-

terial is selected, in that the cases were all referred for one or other disability after head injury, and therefore the incidence takes no account of cases of head injury without disability of any kind. It is therefore intermediate between pensions statistics (disability of longer duration) and case incidence. In these 53 cases the onset of epilepsy had been within one month of injury in 22, between 1 and 6 months in 16, 6-12 months in 8, 1 to 2 years nil, 2 or more years 7. This time incidence follows a curve very similar to that of Feinberg and Symonds, but with a higher incidence in the first month.

In relation to some aspects of head injury the duration of *post-traumatic amnesia* (duration of coma and disorientation) has great importance. The post-traumatic amnesia (p. t. a.) is the best index of the *general* disturbance of the brain caused by the injury (Russell(15), Denny-Brown(14)). It has a distinct relation to prognosis regarding return to occupation (Symonds(13)). It is therefore of interest that in my cases of head injury, of 87 patients whose p. t. a. lasted more than 7 days 3 (3.4 per cent) became epileptic, of 151 patients with 1-7 days of p. t. a. 7 (4.6 per cent) became epileptic, and of 392 patients with *less than one day* of p. t. a. 45 (10.9 per cent) later had seizures. Epileptics numbered 8.4 per cent of the total group. This relationship is exactly inverse to that of persistent intellectual impairment, which is greater the longer the p. t. a., and indicates therefore that local and not generalized brain damage is the most important factor in epilepsy. In cases with long post-traumatic amnesia and traumatic epilepsy there has usually been evidence of some additional local contusion or laceration and the epilepsy often immediate, as in the following case.

Private J. R., aged 19 yrs., was injured in an accident to an army truck. He suffered a depressed fracture of the vertex involving both parietal bones. He was violent for 3 days, and was semi-comatose and incontinent for 14 days, with post-traumatic amnesia for 18 days. Retrograde amnesia was of only a few minutes duration. A nominal aphasia lasted for a week after recovery of orientation. In the first six days of the semi-coma he had a number of convulsions commencing in the right limbs but becoming generalized. No further convulsions occurred and recovery was uneventful after the third week. There was no personal or family history of epilepsy.

If such cases are set aside the relationship is even clearer. These figures however suffer from the short period of observation of my head injury material (the greater part less than one year), and will be subject to final analysis by others who carry on the work at that hospital. In a paper in 1935 analyzing 24 epileptics from a series of 380 civilian cases of head injury Symonds(13) found a p. t. a. of 10 days or more in 12 (50 per cent). This apparent weighting of longer amnesias in favor of epilepsy is contrary to what has been said above, but information from larger series confirms my own impression. For example, the figures of Ascroft(6) for a group without dural penetration show an incidence of 26 per cent in cases not initially unconscious, against 18 per cent in patients suffering from unconsciousness (generalized injury). I have not found other data on this question. It seems that the relative infrequency of brief concussion in the surgical war statistics is the strongest single reason for high epileptic frequency.

The average duration between injury and first epileptic fit in large series is over two years (averaging 2 years and 1 month, Wagstaffe(4), two years and nine months Symonds(13), 22 months in Ascroft's(6) series). Extreme time intervals are, 20 years (Ascroft(6)), 15 years (Feinberg (11)), 16 years (Symonds(13)) and 14 years (Stevenson(1)).

Clinical Problems—Dissociation

The present inability to recognize the epileptic liability before the attacks occur is a severe clinical limitation. The interval may be extremely long. We know that local damage to the brain, particularly with dural involvement, strongly predisposes. The disorder may first manifest itself by preliminary brief vertiginous attacks, study of which may give indication of the growing liability. But such is seldom the case, and as often as not the first attacks are severe and unexpected.

The problem occurs frequently in relation to the assessment of borderline states following head injury. A common problem in the patient who has suffered a severe head in-

jury is what has loosely been termed "black outs." These are essentially lapses of memory of brief duration. These usually do not appear until the patient leaves hospital, and then recur with diminishing frequency over a period of weeks or months. They then usually disappear. So far then their prognosis would appear to be benign. In their lesser forms it would appear possible to explain them by undue preoccupation with other things, as for instance when a patient relates that he remembers starting out to buy some cigarettes at a drug store and then found himself on the way home, cigarettes and correct change in pocket, but no memory of the actual purchase. There is no abrupt transition between this form of dissociated behavior and that covering a period of some hours, with a motivated wandering of the type of hysterical fugue, the memory of which can in some be recovered by strong suggestion under light amytal or other hypnosis, in other cases not. An example will suffice to outline the problem.

L. R. suffered "blunt" head injury on March 9, 1941, with post-traumatic amnesia for 6 days. He had a fracture of the left temporo-parietal region, and the description of his state in the 6 days following the injury is one of mild confusion without evidence of local brain damage. In convalescence he had stabbing frontal headaches which would come on spontaneously or on stooping. He was depressed and worried and could not concentrate well. Three weeks after the injury he was sitting at his home with his wife. A friend called and stayed talking. The patient appeared quiet but otherwise behaved naturally. An hour or so later, the patient suddenly felt he had come out of a sleep, asked where the visitor came from and how he got in. A week later he was making a rail journey, found himself on an intermediate station in the procedure of lighting a cigarette. He had no memory of getting out of the train over 2 hours before. Two weeks later there was a further amnesic incident lasting 15 minutes. He complained of many minor incidents of forgetfulness. His family and personal history gave no evidence of epilepsy or neuropathic constitution. He had no abnormal physical signs. All memory tests, and tests of general intelligence were well performed. An air encephalogram revealed normal ventricles. Electroencephalogram showed no abnormality in 16 standard positions. The amnesia was not recovered under amytal.

It is recognized that emotional states leading to dissociated behavior of hysterical type may coexist with organic damage resulting from head injury and several such cases were encountered. But nevertheless it was pointed out to me by Symonds and remarked upon by Stevenson(1) that the association of these quasi-fugue states with traumatic epilepsy is more common than might be expected from mere coincidence. The dissociation and motivation of the one may be aided by the liability of dissociation in the other. It will be noted that the judgment of an attack may be rendered extremely difficult in the absence of direct observation, by the fact that the electroencephalogram frequently fails to give decisive answer.

Personality Change

It has long been recognized that the constitutional epileptic is liable to show a determination of personality in the direction of irritable impulsive reckless behavior. Occasionally following head injury such change in personality heralds the appearance of epilepsy. The change is however in my own experience seldom clear cut, and when obvious has been on a background of psychopathic pretraumatic personality such as to raise the possibility of constitutional liability to epilepsy. The apathetic state of one patient six months after a severe head injury appeared to have no explanation in his current anxieties or in intellectual impairment. I found him one morning in the hospital ward in a severe major convulsion, the first he had had. Following this his apathy was gone. His electroencephalogram was slightly abnormal before and after this incident, but not sufficiently so to identify it as an epileptic record by the electroencephalographer. The depressed irritable mood for some hours, often days, before an attack is often noticeable even in localized Jacksonian attacks from localized brain injury.

It remains to be determined how far changes of epileptic nature, but not necessarily resulting in overt fits, are responsible for the changes in personality following head injury. Such changes are not explained satisfactorily by reference to damage to hypothalamic or other brain centers.

Vertiginous Disorder

An extremely common phenomenon in the convalescent period following severe generalized head injury is a form of dizziness evoked by sudden change in posture, particularly stooping. There is usually no sense of rotation but one of swimminess and uncertainty. There is also usually no accompanying sign of abnormality of the labyrinth to irrigation or other test. Usually such attacks are benign and subsequently disappear. In some patients, however, there may be momentary loss of consciousness in an attack, in some for as long a period as 20 minutes. In this latter degree the attack is not always satisfactorily explained as one of aural vertigo. Nor is there sufficient evidence of disturbed cerebral circulation to account to such degree of cortical disorder. The observation of gradual transition from such attacks to frank epilepsy in a few patients indicates that intensive study of this phenomenon may assist in unravelling some of the problems of traumatic epilepsy. This subject is also important in statistical study. Stevenson(1) found vertigo common in the latent period before epilepsy began and Rawling(3) comments on the prominence of "fainting" following gunshot wounds. Garland(5) finds minor epilepsy or psychomotor attacks uncommon, but my own experience would coincide with that of Symonds(13), Billet and Lenorment(16), Schou(9) and others that the minor attack is a not infrequent precursor of traumatic epilepsy, and is then commonly preceded by vertiginous aura.

Electroencephalography

Electroencephalography gives indication of great promise in the prognosis of epileptic tendency, but much remains to be accomplished before the prognosis as regards epilepsy is settled by records made in the early period following head injury. Williams(17) found an epileptic type of EEG. without clinical fits in only seven (2.5 per cent) out of 277 convalescing head injury patients in my series, a figure that is little higher than in non-head injury material. Not only is the spike-and-wave pattern of petit mal type extremely uncommon following injury, but other epileptic types of rhythm are found usually only when the clinical fits have commenced.

Williams(18) has also commented upon the frequency of outbursts of generalized rhythmic slow waves in areas of recent cerebral laceration and the close similarity with such outbursts found in idiopathic epilepsy. These outbursts were found up to the eighth day after the injury, were related to an alteration in consciousness, and bore no relationship to the development of traumatic epilepsy. They are extremely characteristic, and are to be sharply distinguished from the persistent slower generalized wave disorder of traumatic stupor, or of increased intracranial pressure.

Here, then, is a phenomenon which is not traumatic epilepsy as the clinician knows it, is not an index of liability to epilepsy, but is indistinguishable from it electrically. The only differentiating factor is the time relation, which is the more remarkable in that the *average* latent period of several reported series of traumatic epilepsy is approximately 2 years. The early EEG. change is closely related but not identical with the phenomenon of early fits and their good prognosis. Adie and Wagstaffe(19), and Ascroft(6) have drawn particular attention to the transient character of epilepsy beginning in the first four weeks after injury. Wagstaffe(4) found 5 such patients subsequently developed further epilepsy after a long interval and was inclined to revise his earlier optimism. These were however all penetrating war wounds, which have an independently high liability to late epilepsy. Ascroft's figures(6) give more accurate appreciation of this problem. In 11 of 19 of his cases who had fits within the first days after injury, fits ceased within the first 2 weeks, not to return. Ascroft also noted a group which he called "temporary epilepsy category II" in which fits eventually ceased but after a much longer interval. There were 19 cases in this group and in three of these the fits began in the first 2 weeks and continued for 2½, 3 and 4 years respectively. The other 16 cases of temporary epilepsy began 3 months to 2 years after the wound, to disappear one to four years later. Ascroft draws attention to the usually good prognosis in these cases as compared with others.

It appears possible that two distinct convulsive factors are operative in head injury, with differing prognosis. Any study which would aid distinction between the two would be well worth while. Until this is achieved it should at least be considered whether early convulsions deserve the name *traumatic epilepsy*, or should the term "immediate traumatic epilepsy" be given some special connotation. There are cases where the diagnosis of epilepsy was made on a single convulsion in the early stage of severe head injury, without subsequent disability, and where diagnosis interfered with subsequent employment.

We have therefore to bear clearly in mind what we mean by epilepsy. "One swallow does not make a summer." Because a drug, or electric shock, or anoxia, will provoke a convulsion it cannot be maintained that "epilepsy" is thereby produced. Nor is vertigo induced by irrigation of an ear Menière's disease. That the convulsive threshold to electric shock is low in epileptics (Walter (20)) does not tell us how it is that such subjects suffer from "epilepsy," which may be only one of several conditions which lower the threshold. Some further explanation is required, namely a reason for persistent lowering of diffusion of dysrhythmia *when once set up*. It is proposed therefore that two separate propositions should be kept distinct: (a) Injury to the brain can bring about an immediate periodic generalized slow wave electrical disturbance. This can occur either as a generalized phenomenon related to severe concussion (generalized traumatic paralysis) or as a periodic generalized discharge associated with a local laceration, sometimes with early convulsions (immediate traumatic convulsions), and (b) the healing process following injury may be associated with a more gradual progressive charge identical with *traumatic epilepsy*.

Neither of these changes has been related to the presence of hereditary epilepsy, and I have found no foundation in fact for the supposition that the traumatic epileptic has already some predisposition. A strong argument is the infrequency of the petit mal spike and wave electrical disorder in traumatic epileptics as noted by Walter(20), and Gibbs, Merritt and Gibbs(21). Yet this formation is the most striking of those with hereditary constitutional tendency. It is predicated by some that all symptomatic epilepsy has a constitutional factor, yet it is remarkable, as Garland has indicated, that such a disease as cerebral cysticercosis invariably induces epilepsy. That is not to say that trauma cannot occasionally provoke pre-existent epileptic liability, but the difference is then usually clear. Thus a patient who was knocked out in boxing, who recovered rapidly but had a petit mal attack that evening and repeated at intervals of one to six days in the ensuing six weeks, and was then found to have a grossly deteriorated interval electroencephalogram, was considered to have had strong constitutional liability. I have also studied two patients whose previous history showed epileptic attacks for some years eventually subsiding with treatment, who suffered severe head injuries without reawakening of their epileptic liability.

Histopathology

Penfield has provided us with two very important hypotheses of the epileptogenic action of trauma. The first is that developed by Foerster and Penfield(7) of the traction of astrocytic scar tissue in cerebral injury, the second by Penfield and Humphries(22) of the mixture of vasomotor control in a cerebro-dural scar. The statistical evidence makes it quite clear that cerebro-dural scar has a high epileptogenic quality. There appears to be clear indication for the development of a non-adhesive membrane such as that proposed by Chao, Humphreys and Penfield(23) and Penfield(24).

We must not however allow this important aspect of the problem to distract our attention from the fact that not all epileptogenic scars are cerebro-dural, and some not particularly fibrous. The author has one autopsy specimen from closed head injury when the scar, which is located in the region of the anterior perforated spot, shows no evidence of traction on surrounding parts and no involvement of dura. In another there is the usual plaque jaune on the under surface of a frontal lobe not attached to the dura. The last is interesting in that the first and fatal attack of epilepsy was the abrupt on-

set of status epilepticus some five years after the injury. In both these cases the persistence of some damaged nerve cells in the next gyrus is an unusual feature. Such neuronal changes were noted by Penfield and Humphries(18) who attribute them to vascular changes. It does not however appear that the cell changes are always progressive in such scars. A focus of electroencephalographic activity must always be damaged nerve cells. It is suggested that there are types of nerve cell damage which are worthy of study in this connection.

It is generally now well understood that the Jacksonian type of epilepsy, including also generalized attacks with focal onset, occurs in less than half of any consecutive series of cases of traumatic epilepsy (Schou(9), Billet and Lenormant(16)) and that though minor attacks and psychomotor attacks are perhaps less usual than in hereditary or constitutional epilepsy these do occur in an appreciable proportion of traumatic epileptics. Localized Jacksonian epilepsy has an excellent prognosis for surgical treatment. Traumatic epilepsy which begins as focal or Jacksonian attacks tends to become more and more generalized as time passes. It is not however clear to what extent the degree of generalization of an attack impairs the prognosis for successful surgical excision of scar. My own observations are not sufficiently numerous to give a satisfactory conclusion. The question is one that has great practical importance, and requires review in the light of modern surgery and investigation.

Conclusions

Epilepsy is an infrequent complication of injury to the head in general. All present information indicates that laceration of the brain is an essential factor, whether or not accompanied by injury to the skull or dura, though accompanying laceration of the dura and especially sepsis greatly increase the liability. It is considered important from the point of view of prognosis to separate early conclusions (within for example the first eight weeks) from epilepsy of later onset. There are also indications that it is advantageous to grade different severities of convulsions, of which the only index we have at present is degree of generalization. Intellectual impairment is an unsatisfactory clinical index of prognosis for the type of head injury which it most frequently follows is one that does not have high liability to convulsive disorder.

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THE EFFECT OF INTRAFAMILY DISCORD ON THE PROGNOSIS OF EPILEPSY[1]

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INTRODUCTION

Epilepsy, insanity and mental deterioration have long been associated in the minds of both physicians and laymen. Recent studies have made it clear, however, that the tendency to have seizures in itself has little to do with mental and emotional disturbances. While seizures occur in patients who are legally "insane," and while many epileptic patients are committed merely because there is no other way of taking care of them, the great majority of epileptics outside institutions do not show statistically significant deterioration. There have been several large-scale psychometric studies on groups of epileptics. The range and average of performance evidently depend on the source of the group studied, rather than on the fact that the subjects all suffered from seizures. Thus, the average I. Q. in Fox's series of institutionalized patients was 65(1), and the extramural group studied by Somerfeld-Ziskind and Ziskind showed an average of 93(2). Non-institutionalized patients have been found to make much higher average scores in all the series studied(3, 4). In our own series of 40 cases (to be reported elsewhere) in which the Bellevue-Wechsler scale was used, the I. Q.'s have been found to vary from the level of the mental defective (55) to that of the genius (165), with an average of 100. Lennox(5) found some evidence that there was a slight decline in the average I. Q. over a period of years. Retesting a few of our cases after intervals of 1 to 3 years, failed to demonstrate a definite change.

Mental and emotional peculiarities do occur among epileptics, however. It has been shown recently that the phenomena described as "mental deterioration" may be of various types. One is the actual destruction of brain tissue by a pathologic process which also causes seizures; but this is fortunately rare(6, 7). The second—somewhat questionable—cause is the tissue damage which may, perhaps, be caused by the seizures themselves(8, 9). The third is the effect of sedative drugs (2, 10, 11). The fourth is the "periodic dulness" and psychomotor disturbances which may be looked upon as equivalents or variants of the seizure itself(12). Finally, there is the psychologic burden which any chronic disease imposes, aggravated in the case of epilepsy by the peculiarly frustrating nature of the symptoms(13, 14).

In studying this last factor, we have been much impressed by the influence of the attitudes of other members of the family upon the patient's welfare. If the family group as a whole takes a realistic and helpful point of view about the illness, the patient is placed in the best possible situation to profit from his medical treatment and find a place in society. On the other hand, if relatives have a sense of shame about the disorder, and make the patient bear the burden of their anxiety and distress as well as his own, the benefits of otherwise adequate treatment may be nullified. The danger is particularly great with young patients. An overprotective attitude on the part of the parents during formative years is apt to perpetuate an immature adolescent approach to life on the part of the patient. Since seizures begin during or before adolescence in over 75 per cent of cases, the problem is a prevalent one.

The following case histories have been chosen to illustrate the influence of the family attitude, and how it may sometimes be modified to the patient's advantage:

CASE 1.—*B. D. Female. Age 12 years.*
Duration of recurrent seizures 5 years. Complete

[1] Read at the ninety-ninth annual meeting of The American Psychiatric Association, Detroit, Michigan, May 10-13, 1943.

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relief of symptoms except for occasional petit mal attacks followed treatment with phenytoin sodium.

There was considerable intrafamily discord which was quite disturbing to both parents and patient. A constant, watchful, waiting attitude of the mother for "that seizure that might occur" caused her to limit her daughter's activities to child-like tasks. Morning and evening the patient was reminded to take her medicine, irrespective of the fact that she was quite ready to take the responsibility. The patient was repeatedly warned of the dangers of a possible impending seizure but was given no instruction as to what to do should it occur. She was resentful of her mother's attitude and said so. The mother on her side resented what she considered her daughter's insubordination. Furthermore she was resentful of the fact that her daughter should have seizures because it hampered the social activities of the rest of the family. The vicious circle was established and the situation continually deteriorated.

A reasonable relationship was re-established by educating the patient in regard to her illness. She was given the responsibility of her medication and the restrictions on her social activities were relaxed. The patient was allowed to take long train trips alone during which one or two transfers were required. The mother was brought to realize that the likelihood of the occurrence of serious accidents is not greatly increased by the daughter's illness.

In this case a markedly abnormal intrafamilial relationship was corrected by reasonable information concerning epilepsy. All parties involved came to accept the illness realistically. Treatment was entrusted to the patient. The fear of impending disaster is almost entirely dispelled.

CASE 2.—*J. R. Male. Age 21 years.*

Duration of recurrent seizures 4 years. Seizures formerly occurred weekly. Medication reduced the frequency to one attack every 2 weeks to 3 months. In spite of this frequency of seizures, the patient owns and operates successfully a photographic studio.

An over-anxious mother and father had established a continuous vigilance over the patient's limited activities. Exercise and social contacts had been reduced to a minimum and employment was discouraged. Repeated questioning by the parents concerning the regularity of medication became monotonous. Every diversion from the family circle was frowned upon. If the patient rebelled against his restrictions, admonition from the parents became so obnoxious, that he either ignored the incident or reproached his mother and father in an aggressive, pugnacious, disrespectful manner. This may have been in part a manifestation of psychomotor lability.

The parents were reluctant to accept a realistic explanation of the situation. They could hardly believe weekly seizures could recur over a period of years without some definite effect on the patient's mental capacity. They became more reasonable however on witnessing the improvement in the patient's personality which followed relaxation of social and economic restrictions, the patient's asumption of responsibility for treatment, the economic improvement which followed certain minor changes in his business, such as the employment of an assistant to take his place should he be temporarily incapacitated. Though they still repeatedly reproach the patient for keeping irregular hours at work or in social activities, he has learned to accept these admonitions as one of the unavoidable disadvantages of his illness. Friends, business associates and hospital employees have spontaneously commented on the improvement in his personality, which is more tolerant, cooperative and amiable.

Acceptance of his seizures as a handicap, socially and economically, and the institution of appropriate measures to compensate for the disability incurred by the seizures allow this patient to live normally.

CASE 3.—*Baby M. Female. Age 22 months.*

Duration of seizures, 2 weeks. One to nine attacks occurred daily. Complete relief of all symptoms followed administration of phenytoin sodium.

Without apparent cause, recurrent tonic seizures occurred and persisted in spite of phenobarbital therapy. The mother and father were panic-stricken by their helplessness. To augment this sense of hopelessness, the grandmother and grandfather predicted impending insanity and the family physician concurred. Only those toys were selected for the child which could not cause injury if the "inevitable" fit should occur. An all night vigilance was planned in order to prevent injury to the child if a seizure should occur during sleep.

The parents were encouraged by the fact that the child seemed normal between attacks. They were a little alarmed, however, over the occurrence of temper tantrums and disobedience which the patient had acquired in the two weeks following onset of seizures. Though they suspected that these traits were a result of excessive attention given the child during this period, they could not fully convince themselves this was not the onset of "insanity."

The parents were informed that mental deterioration is infrequent in epilepsy. They were instructed to discipline the patient irrespective of recurrent seizures. They were persuaded to allow the child access to the the entire household and social contacts commensurate with its age. A normal diet was re-established.

As a result of these suggestions, the child is developing normally, for example, attends parties, accompanies her parents on social calls and plays freely with the neighborhood children.

CASE 4.—*D. A. Male. Age 31 years.*

Onset of seizures was at 14 years of age. Frequency has been 1 every 12-18 months. This pleasant young man, well-educated and intelligent, stated he had always been successful in hiding his seizures from his closest associates. Although he was curious about his condition, he was afraid of what he might learn so he ignored it. While in college, he roomed with a pre-medical student and frequently made attempts to talk to his friend about epilepsy but never had the courage. He further stated that he had been "pretty lucky," because his seizures had not bothered him much. After leaving college, he married. The patient had taken phenobarbital

over a period of several years, but as it did not alter the frequency of his seizures, he stopped the medication. The result was that two seizures occurred in one week. He was admitted to the hospital in a highly nervous state which was made worse by the anticipation of seizures in his first child, recently born. The fear of heredity, coupled with that of having to face the handicap of more frequent seizures, seemed likely to rob him of the satisfaction which he might otherwise have felt over his success in business and family life.

In this case, the patient obtained a normal social and educational adjustment in spite of infrequent seizures. He ignored the handicap, or rather faced it realistically. His wife accepted him without reservation, with the result that a normal family relationship had been maintained.

CASE 5.—*M. B. S. Female. Age 41 years.*

Recurrent grand mal, petit mal and psychic equivalents for 23 years.

The onset of recurrent seizures occurred during the summer following a year at college. The parents were surprised and horrified by the occurrence of this "hideous thing." The patient was told it was a "nervous condition" which often occurs at about the age of puberty and would disappear in a few years. She was not allowed to return to school. Private tutors and a governess were employed to carry out a carefully planned regimen to prevent tension, excitement and fatigue.

She was allowed few duties around the house. On minor complaints she was excused from the juvenile responsibilities allowed her. She was never reproved, even mildly, for fear that a seizure might occur if she became excited. The necessity of rest and quiet was urged upon her to prevent the "nervous condition" recurring. In the attempt to minimize the supposed danger of her condition, rigid restrictions were employed which aroused the patient's curiosity. She could not understand why such rigid measures were used in the treatment of a mild disorder. Her rebellions were appeased rather than being met with appropriate explanations. Her confusion rapidly increased. Insubordination, disobedience and disrespect characterized the attitude of the patient toward her parents.

Family and friends assumed a hopeless attitude toward the patient. They considered her a "brave little soldier" to stand up under her misfortune. Such phrases as this failed to moderate her temper tantrums, and the tension within the family progressively increased.

After 20 years of such an existence, the patient was given phenytoin sodium, which has reduced the incidence of seizures markedly. At the age of 40 years, the patient enjoyed a vacation alone for the first time in her life. Her activities were limited only by her own desires. Her companions offered her free social contacts and required her to adjust herself to the environment. She went horseback riding, swimming, walked in the woods, and took other activities as she desired.

She is now employed in a library. She is required to perform duties usually assigned to a librarian. A few recurrent seizures have not prevented her from undertaking increasing responsibilities.

In this case, unjustified restriction of activities prevented social and psychological development. Her adolescent personality persisted for many years, but is slowly being replaced by an adult attitude. Over-protective, over-sympathetic, appeasing attitudes have been replaced by constructive advice, reasonable explanations of the nature of the disorder, and the patient has made a genuine attempt to adjust to both social and economic environment.

CASE 6.—*B. W. Female. Age 18.*

Grand mal seizures of 3 years' duration. Freedom from symptoms for 2 years on phenytoin sodium therapy.

An attractive young lady with normal mental and psychological development was suddenly forced into isolation from all social contacts by her mother because of the onset of seizures. Her mother anticipated the "most hideous" results should the seizures recur. She was horrified with the thought that anyone should see the patient in a seizure. She could not investigate the possibility that seizures had occurred in other members of her own or her husband's family for fear it would draw the relatives' attention to the patient. She stated that she had never heard of insanity or "this horrible thing" occurring previously in the family or she would never have married and borne a child. The patient revolted against such tyranny and appealed to her father. Without the mother's consent the patient and her father sought medical aid.

In this case, the patient's mother continues to consider that epilepsy is synonymous with insanity. She refused to accept responsibility for her daughter's social activities. She is resentful of her daughter's and husband's mutual understanding of an unavoidable handicap. Though the patient is developing normally, the intrafamily discord continues because of the mother's refusal to re-evaluate the term "epilepsy."

CASE 7.—*B. J. Male. Age 25.*

Grand mal, petit mal and psychic equivalents, have recurred during the past 5 years. Treatment with phenytoin sodium and phenobarbital has reduced the frequency of grand mal and petit mal seizures. Continued employment has been prevented by recurrent psychic equivalents. An average level of intelligence was revealed by psychometric studies, and the patient has made an honest attempt to work.

The family has been loath to allow the patient to leave the house alone. On the other hand, no one of the family is eager to accompany him on the street, to the movies or other outings for fear an attack might be observed by strangers.

This attitude is predominantly fostered by the patient's mother. She has refused to believe that anything can be done to relieve epilepsy, in part because of her personal experiences. All attempts to convince the family that epilepsy does not imply insanity have been without effect. The patient's mother is principally concerned with the attitude of the public toward her and her ancestry if her son's condition should become known. She fears economic and social ostracism.

It is interesting to note the attitude of the mother toward her son. She resents the social scourge in the family. She persistently imparts this resentment to her son by derogatory statements. He is accused of missing his medication, thereby precipitating seizures as well as shirking childish responsibilities allowed him. She warns him that if he continues to deliberately ignore the social restrictions "one of those things" may occur in any public place where anyone might see him. He is not allowed to discuss epilepsy or assume responsibility for his medication. The patient's mother refuses to admit that she failed to administer medication prior to one of the seizures after having assumed the responsibility for treatment. She would not acknowledge she had lost contact with the rigid regimen which she had initiated.

Points of interest in this case are: (1) The patient was not permitted to take responsibility of his treatment, but if seizures occurred he was accused of laxity: (2) the family refused to give up the idea that epilepsy is a hereditary form of insanity; (3) fear of social and economic ostracism resulted in an active resentment toward the patient; (4) a regimen was instituted which completely ignored all mental and physical qualifications possessed by the patient for rehabilitation.

CASE 8.—*W. C. S. Female. Age 55.*

Grand mal seizures have recurred for 40 years.

The patient's father was a physician. He devoted a major portion of his time formulating plans to relieve the patient of mental and physical exertion. She was removed from school and given a skeleton education by private tutors. She was relieved of all responsibilities about the house. No opportunities for educational or social accomplishment were offered by the family. The patient was allowed the freedom of her home but was assisted by her family in making social and household plans. Her activities outside the home without a companion were limited to restricted areas.

Her husband readily accepted the presence of epilepsy but did not succeed in counteracting the over-protective, over-sympathetic attitude of the patient's family.

When the patient was admitted to the hospital for an examination, one of her sisters accompanied her to the department of psychology. She was alarmed and indignant that the patient should be subjected to psychological studies. She stated the tests were unfair to the patient as she had not had the advantage of cultural contacts. This objection was immediately qualified by stating to the examiner, "You would have no suspicion of insanity if you should play bridge with my sister." The psychometric examination showed her intelligence to be above average. During the examination, the patient's insecurity, immaturity, introversion, and adolescent mannerisms alternated with evidences of extroversion and maturity when current topics were discussed.

Though resentful of her family's protective attitude she appeared to accept it gracefully. The best efforts of her physicians failed to modify the situation. She took her own life a few months after returning home from the hospital.

In this case, the patient's family openly denied that she was mentally normal. Personality traits similar to those of a normal adolescent dominated her social contacts. It seemed fairly clear that she had been prevented from reaching an emotional and intellectual maturity by the attitude of the family.

CASE 9.—*M. C. Female. Age 43.*

Onset of grand mal seizures at the age of 13 years. The seizures were infrequent and were controlled by phenobarbital therapy. The patient completed high and business schools; and has been employed for 20 years in the dry goods business. She has supported and acted as a business agent for her mother for the past 13 years.

As far back as she can remember her brothers and sisters have admonished her for going to the theater or walking alone. They have requested that she sit in the rear of the theater if she should go. They have discouraged all social activities.

The patient has never visited her sisters in their homes. Even though the last seizure occurred 13 years ago, the patient's sisters have a mortal fear of "that seizure that may occur" and are reluctant to have marital or blood relatives aware of the presence of epilepsy in the family.

The patient accepted this intrafamily discord for years. She was frightened recently when her employers threatened to expose her to any firm to whom she might apply for a position if she found it convenient to seek other employment because of differences in salary. Her family has continued to refuse to consider any of the newer information concerning epilepsy. The patient has no friends from whom she could seek advice. Anxiety states, insecurity, chronic fatigue, and simple depressions have increased the prominence of her incomplete social adjustment. Without continuous employment to distract her attention from her social plight, the patient became panicky, severely depressed and assumed an attitude of defeatism. Repeated anxiety states accompanied by hysterical paraesthesias prompted the patient to seek medical attention.

A reasonable explanation of epilepsy and its relation to insanity, the statistics of inheritance, and the favorable outlook for her considering that she had been free of seizures for 13 years, altered the psychological conflicts materially. She was persuaded to inform one of her friends of the nature of her illness, and felt a marked relief of tension and anxiety. She finally consented to visit her friend for a period of a week, something she had never attempted before. In fact, for the first time in her life she had discussed epilepsy with a layman.

COMMENT

From the histories cited, it may easily be seen that the fear of seizures on the part of the patient or relatives may be more devastating than the seizures themselves. A patient suffering from frequent seizures may lead a contented and useful life if he learns

to face his handicap realistically, as in Case 2. A successful adjustment is, of course, much easier to attain if the seizures are fully or partially controlled, as in Cases 1, 3, 4, and 5. But in any case an openminded, wholehearted consideration of the opportunities in any individual case will go far toward placing the patient in an optimum position in society.

The social problems created by the existence of seizures can occasionally be met successfully by ignoring the attacks (as in Case 4). This solution is seldom a satisfactory one, however, for it involves the psychologic disadvantages of suppression and also usually the practical disadvantages of inadequate medical care. A day of reckoning usually occurs sooner or later, and the problem is then more difficult to face than it would have been earlier.

It is important for the patient to assume responsibility for his medication and the precautions he must observe, in most cases. Divided responsibility often leads to lapses and recriminations. If the patient is actually incompetent, because of age or of deterioration due to structural disease of the brain, he must of course be given adequate supervision, but this is seldom necessary.

Usually it is unwise to plan an occupation or a way of life for a patient until the effects of optimum medication and hygiene have been observed over a period of months. Patient and relatives should be specifically cautioned not to take the course of the disease prior to treatment as inevitable.

Seizures can often be controlled by medication, exercise, minor changes in hygiene. Only moderate precautions need then be taken and the patient is reasonably free to pursue the life of his choosing. It should be the aim of the physician to determine the least burdensome routine of life which is effective. The more rigid the restrictions which the patient must observe, the greater the psychologic tension and also the danger of serious lapses from treatment.

Both the patient and his family should understand as much as possible of the modern point of view about seizures and the principles of treatment. It is true that some aspects of the situation are disconcerting to the uninitiated, but the alarm which might be attributable to a knowledge of the facts is seldom to be compared to needless terror which is often produced by current misconceptions.

Summary

In many cases of epilepsy, the seizures themselves may be controlled by treatment or are not incapacitating, and yet the patient is unable to make a satisfactory social and economic adjustment. The emotional handicaps produced by any chronic disease have long been recognized. In regard to epilepsy, however, faulty attitudes such as shame, over-protectiveness, over-strictness, etc., on the part of the patient's family constitute a particularly serious barrier to recovery. Typical case histories are presented, and suggestions are made as to methods of correcting the attitudes at fault.

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GENETIC AND ENVIRONMENTAL FACTORS IN PSYCHOSES OF CHILDREN[1]

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If we are to bring about a more healthful America we must find the factors productive of health and the opposing forces underlying illness. Herein lies the basis for a research project that we have undertaken in the mental health field during the past two years. The study was formulated in such a manner as to classify significant factors in the lives of a group of children with psychoses and a control group of average children, showing the relative prevalence or weight of factors found in each group as a whole. Information has been compiled with regard to the background and early life of these children, the pressures exerted by the environment, and the emotional conflicts that may have resulted from these hereditary and environmental influences.

Fifty-six children, diagnosed as psychotic, were secured for the study from the Massachusetts state mental hospitals. They ranged in age up to 19 years, and were reported to be of normal intelligence prior to the onset of their illness. A control group of 56 average children was matched with the psychotic children on the basis of age and sex. It was our aim to obtain an unselected group, and 5 of the Massachusetts school systems cooperated by providing lists of names of 5 average children of the designated age and sex. One child from each list of 5 names was accepted at random. While this method of obtaining an unselected group is open to criticism, it can be said that for practical purposes the wide range of material obtained fulfilled our specifications quite satisfactorily.

The genetic and environmental factors in the psychotic group were evaluated by studying the hospital records of the 56 children, by reviewing the case material of 38 social agencies, and by interviewing the parents of 35 of the children. Parental interviews were not possible in 21 of the cases because of unestablished or broken homes. In the control group, complete histories were obtained and parental interviews were conducted in all 56 cases. The school records were also available for examination.

Special consideration has been given in this study to heredity, health, social and personality factors, with particular reference to early behavior patterns and emotional relationships of these children. Pertinent information has been obtained regarding their parents, grandparents and other relatives, their home surroundings, and the economic and social factors which may have influenced their behavior. From the material gathered, we are convinced that mental illness is a complex problem in which many interrelated factors play important parts.

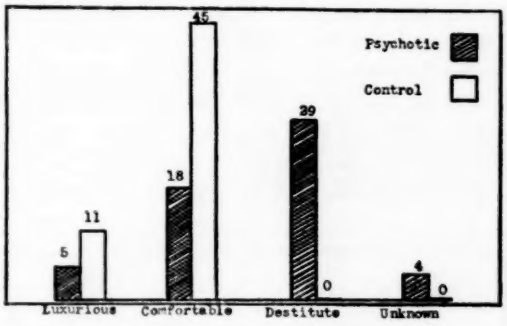

CHART I.—Type of home.

Chart I shows the types of homes in which all of the children resided. "Luxurious" indicates an expensive home with costly furnishings; "comfortable" denotes a home adequately to amply provided; "destitute" signifies a home lacking in the necessities, including food, clothing and space. It is interesting to note that the only "destitute" homes were found in the psychotic group. All the children in the control group came from homes described as "comfortable" or "luxurious."

[1] Read at the ninety-ninth annual meeting of The American Psychiatric Association, Detroit, Michigan, May 10-13, 1943.

Chart II, indicating the types of neighborhoods, closely parallels the chart on homes. Forty-seven of the children in the control group resided in neighborhoods that were considered to be average or above average, while the majority of the psychotic group came from neighborhoods that were below

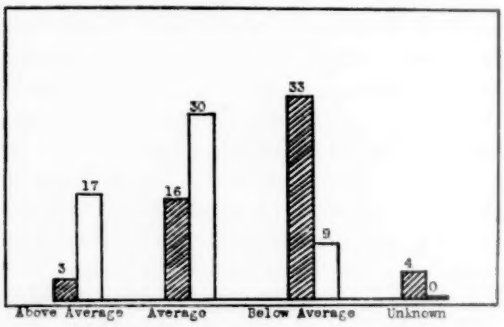

CHART II.—Type of neighborhood.

average. Ten of the latter type of neighborhoods were isolated, 6 were in delinquency areas and 6 were neighborhoods where continental standards were maintained.

The economic status of the families showed great variance, but was much better for the children in the control group than in the psychotic group. All but one of the children

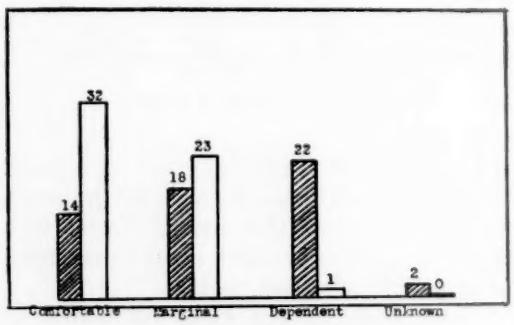

CHART III.—Economic status.

in the control group came from homes of either "comfortable" or "marginal" economic level, while 22 of the families of the psychotic group were dependent upon agencies.

A study of the fathers' vocations brought out the fact that 24 of the fathers in the psychotic group were in the lowest vocational brackets, while only 6 in the control group came within this classification. Professional vocations including physicians, lawyers, bankers and teachers were well represented by 13 in the control group as against 2 in the psychotic group.

The marital situation was very significant. In our study, it was observed that nearly twice as many of the children in the control

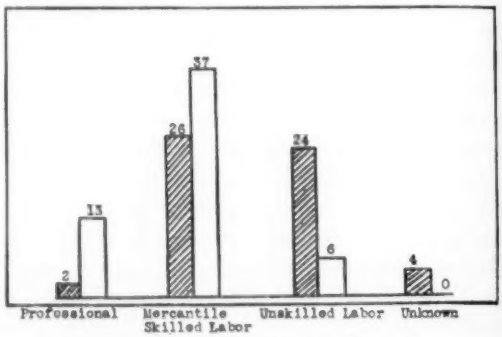

CHART IV.—Vocations of fathers.

group as in the psychotic group had the advantage of the care and guidance of both parents in the home. Thirty of the psychotic children as compared to 10 in the control group had lost either their father or mother by death, divorce, separation or desertion. Of the 30 in the psychotic group, 5 of the mothers were unmarried.

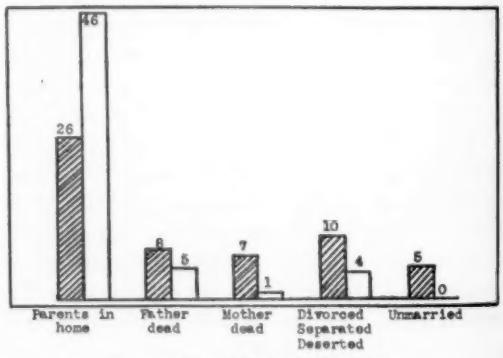

CHART V.—Marital situation.

From a purely impressionistic point of view, we have classified the parents into two general groups; namely, "adequate" and "incompetent." These terms were used to denote whether or not the fathers and mothers were satisfactorily fulfilling their rôles as parents. Thirty-seven fathers and 17 mothers of the psychotic children were "incompetent" as compared to 9 fathers and

4 mothers in the control group. It is indeed significant that in the psychotic group 9 fathers and 10 mothers were immoral, 9 fathers and 7 mothers had criminal records, 15 fathers and 2 mothers were addicted to alcohol, 16 fathers and 21 mothers had poor physical health, 25 fathers and 23 mothers were said to be "nervous" or emotionally unstable, while 5 fathers and 7 mothers had confirmed diagnoses of mental or nervous diseases. The control group by comparison presented fewer adverse factors. Two fathers were immoral, 3 were addicted to alcohol, 9 fathers and 5 mothers had poor physical health, and 16 fathers and 15 mothers were described as "nervous" or emotionally unstable.

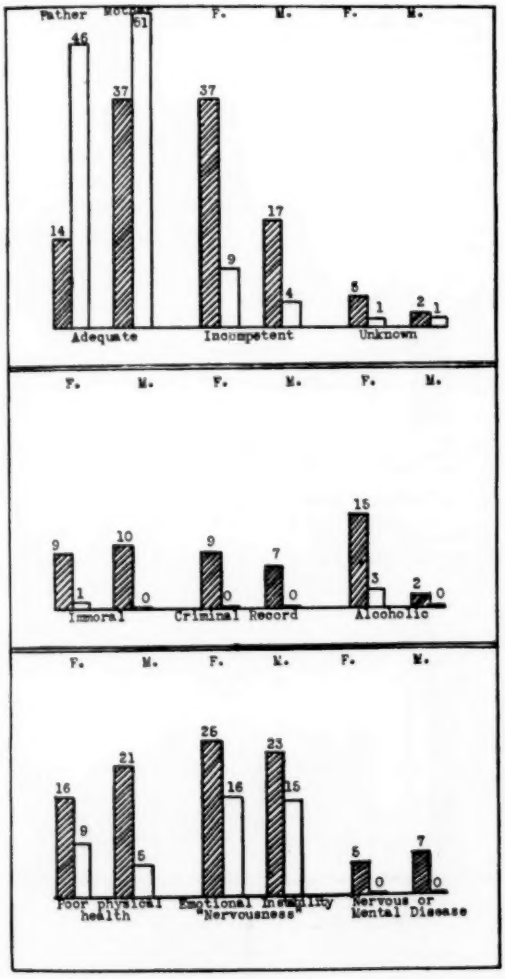

CHART VI.—Parental classification.

The sibling situation was important from many points of view. There were 170 living sisters and brothers in the psychotic group, and 111 in the control group. Of the 170, 18 were diagnosed mentally defective, 8 psychotic, 9 adjudged delinquent and 15 were serious behavior problems. By contrast, only 2 in the control group could not come under the classification of normalcy, as one had a frank psychosis and one was a serious behavior problem.

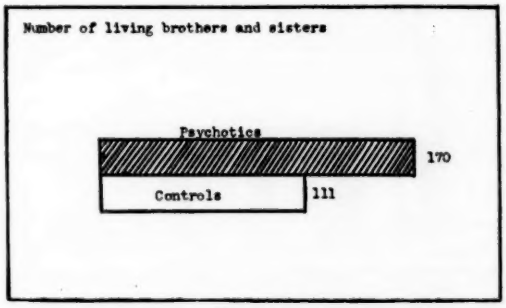

CHART VII.—Siblings.

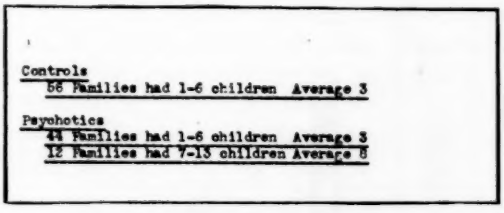
Controls
56 Families had 1-6 children Average 3
Psychotics
44 Families had 1-6 children Average 3
12 Families had 7-13 children Average 8

CHART VIII.—Size of families.

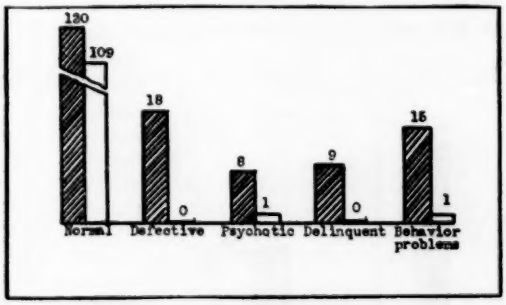

CHART IX.—Type of siblings.

Hereditary factors of mental or nervous diseases involving the parents, grandparents and maternal and paternal siblings were reported in the families of 38 of the psychotic children. Included in the histories were such diseases and conditions as Parkinson's dis-

ease, Huntington's chorea, epilepsy, neurosyphilis, manic-depressive psychosis, schizophrenia, involutional psychosis, alcoholic psychosis, psychopathic personality, emotional instability, alcoholism, delinquency, crime, immorality and mental deficiency. Two of the families in the control group had histories of mental illness in one of the grandparents.

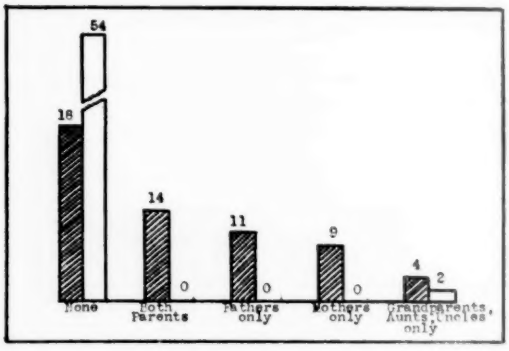

CHART X.—Hereditary tendencies.

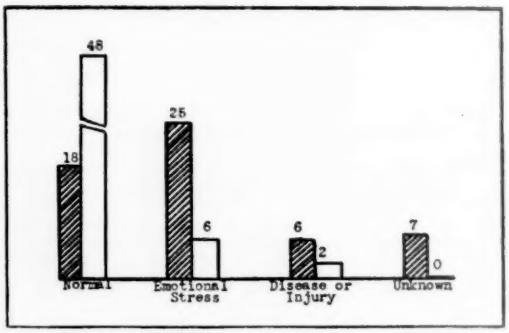

CHART XI.—Prenatal condition of mother.

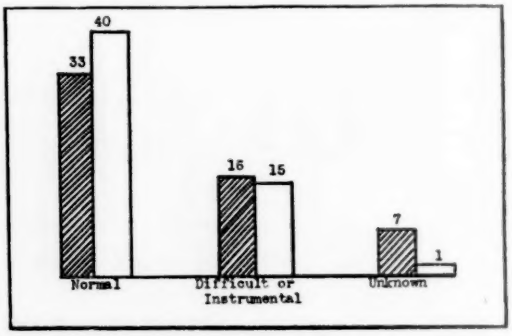

CHART XII.—Birth.

A study of the prenatal and natal condition was next considered. Thirty-one children in the psychotic group showed adverse prenatal conditions due to physical injury or disease of the mother, or such mental factors as severe stress and emotional shock resulting from violence, destitution and illegitimacy. In the control group, similar situations existed in 8 cases. Considering the natal conditions, difficult or instrumental deliveries were equally divided between the two groups.

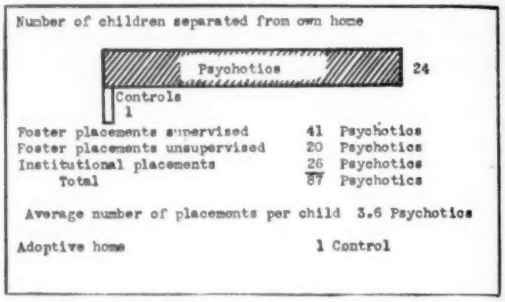

CHART XIII.—Insecurity of life situation.

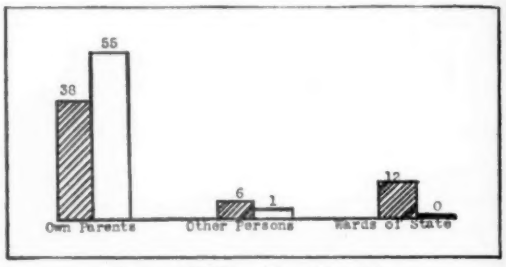

CHART XIV.—Guardianship.

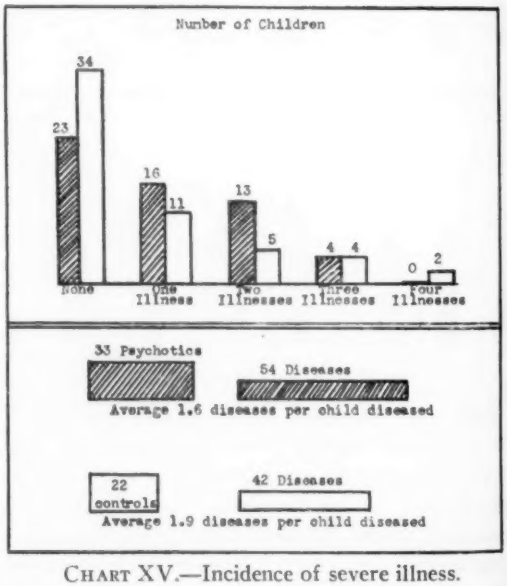

CHART XV.—Incidence of severe illness.

Insecurity of life for the psychotic children was evidenced by the fact that 24 chil-

dren were separated from their own parent or parents. In contrast, one child in the control group was adopted. Furthermore, the 24 psychotic children had a total of 87 placements or an average of 3.6 placements per child. Considering guardianship, 18 children in the psychotic group and one in the control group was being cared for by persons other than their own parents.

TABLE 1

INCIDENCE OF DISEASES

Diseases	Psychotic group	Control group
Pneumonia	15	12
Scarlet fever	8	9
Diphtheria	4	1
Meningitis	4	6
Others	23	14
Total	54	42

The matter of serious illness is one that merits comment. Thirty-three of the psychotic group had from one to three serious illnesses per child, as compared to 22 of the control group who had from one to four such illnesses per child. You will note that as the number of illnesses per child increased up to four the psychotic was less often represented.

THE PSYCHOTIC GROUP

TABLE 2

DIAGNOSES OF PSYCHOSES

Organic changes of nervous system	12
Functional	
Dementia præcox and schizophrenia	42
Manic-depressive psychosis	2
Total	56

TABLE 3

PERSONALITY PATTERNS OF PSYCHOTICS

	44 functional cases	
12 organic cases	11 aggressive	33 submissive
Unmanageable	Defiant	Immature
Irresponsible	Irresponsible	Overattached
Overactive	Overactive	Insecure
Destructive	Excitable	Seclusive
Asocial	Asocial	Unsocial

TABLE 4

AGE OF PROBLEM BEHAVIOR

	Per cent
Organic—before age of 9 yrs.	83
Aggressive—before age of 9 yrs.	88
Submissive..from 12 to 18 yrs.	85

As pointed out in the previous study of psychotic children, the cases associated with organic brain disease all presented the symptoms of aggressiveness, overactivity, destructiveness, unmanageableness and asocial tendencies. This symptom complex had its onset prior to the age of 9 years. In the functional cases, there were two distinct groups characterized as "aggressive" and "submissive." The personality pattern of the "aggressive" group, consisting of 11 cases, was demonstrated by excitability, overactivity, defiance and irresponsibility. This change in personality began prior to the age of 9 years. The personality of the submissive group of 33 cases was characterized by immaturity, overattachment, insecurity, seclusiveness and unsociability. These children did not show a definite change in personality until the age of 12 to 18 years. As we have indicated in the earlier study, the personality pattern of the organic type closely resembled that of the aggressive functional type. This makes one more convinced than ever that the aggressive functional cases have definite organic disease that has been unrecognized.

THE CONTROL GROUP

TABLE 5

PERSONALITY FACTORS

36 aggressive	20 submissive
Sociable	Gentle
Responsible	Responsible
Ambitious	Good-natured
Perseverant	Sensitive
Independent	Dependent
Self-confident	Lacking confidence
Leaders	Followers

TABLE 6

MALADJUSTED CASES

ATTITUDES

9 aggressive	13 submissive
Resentful of authority	Overattached to mother
Willful and defiant	Oversensitive
Jealous	Secretive
Selfish	Moody
	Effeminate

CONFLICTS

School adjustment.	6	School adjustment.	3
Social striving..... (marginal income 1)	4	Social inferiority.. (marginal income 10)	12
Financial	1	Financial	5
Love affair.....	2	Religion and death.	3

Now to turn to the control group, we find two of the same personality patterns as seen in the psychotic group. The aggressive symptoms that were recognizable in the psychotic group by asocial trends were directed in the control group into channels of achievement and social leadership. The submissiveness that promoted seclusiveness, overdependence, and inability to hold one's own in a group of the psychotics was observed in a milder form in the control group. Their submissive personality was characterized by sensitiveness, pliancy and lack of confidence, although these children were conscientious and dependable.

While the children in the control group showed fewer genetic and environmental factors that might relate to a psychosis, 22 cases revealed the usual variety of personality problems brought on by maladjustments and emotional conflicts. The greater number of these maladjusted children were of the submissive type. In early childhood they had such neurotic symptoms as fears, sleep disturbances, nail biting and vomiting, whereas the aggressive children had expressed their aggressiveness by overt rebellious behavior. The 13 maladjusted submissive children later became oversensitive, secretive, irritable and overattached to their mother, and the 9 aggressive cases developed attitudes of resentment, willfulness, selfishness and jealousy. This situation was the reverse of the condition found in the psychotic group where the aggressive type presented more serious problems prior to their illness.

The conflicts seen in the aggressives of the control group were related for the most part to school failures, due to low intelligence and the fact that some of the children were nonreaders. The submissive children on the other hand were good students and had fewer school failures.

Conflict with society was characteristic of the children in the submissive group. Many of these children came from homes of marginal income, which was a handicap in their competition with the more privileged students. In some instances they developed a sense of shame because of their limited home environments and their inability to afford social activities. We see in the aggressive children the development of social conflicts because of their striving to get into the upper clique and maintain their prestige.

Five submissive children had conflicts brought on by financial stress in the home, while 2 were preoccupied with religious conflicts and thoughts of death. Three aggressive children had suffered birth injuries.

The incidence of serious illness was higher in the maladjusted children than in the well-adjusted group and, no doubt, was a contributory factor in their unfavorable personality development.

TABLE 7

SIGNIFICANT FINDINGS

	Psychotic cases	Control cases
Hereditary tendencies in parents	38	2
Abnormal siblings	50	2
Turbulent home life	43	17
Conflicting discipline	33	11
Brutal discipline	22	4
Hatred of parent by child	17	3
Overattachment to parent	28	13
Perfectionist parents	10	3
Destitute homes	29	1
Unwholesome neighborhoods	33	9
Foster home or institutional placements	24	0
Dependent families	22	1
Social Index registrations	45	14
Registrations—psychotic group	326	
Registrations—control group	16	
Severe illness	33	22
In psychotic group	54	
In control group	42	
Stress in prenatal period	31	8
Difficult or instrumental delivery	16	15

The maladjusted children in the control group in many instances overcame their difficulties as they approached maturity and became independent of home influences. The security of the home may well be considered a contributory factor in their readjustment. In contrast, we find that many children in the psychotic group were thrown out into the world before they had attained sufficient independence to cope with its problems.

SUMMARY AND CONCLUSIONS

1. The predominance of unfavorable hereditary tendencies in the parents of the psychotic children was emphasized by the fact that there was a large number of abnormal siblings in this group.

2. A most striking revelation was the total lack of security in the human relationships to which the psychotic children were subjected. It is appalling to note the disturbed home life, the beatings and the brutal treatment these children received, and the hatred many of them bore toward their parents. There were many abnormal attachments to parents or parent substitutes, which kept the children immature, repressed, dependent and insecure in their social relationships. The perfectionist parents set up standards too high for their children to attain, and here we found the children in conflict because of feelings of guilt and inadequacy.

3. The insecurity of the psychotic group was further evidenced by the large number of destitute homes, inferior neighborhoods, and placements in focter homes and institutions. Low economic status prevented the children from having even the necessities of life and opportunities productive of normal development. The burden that the families of the psychotic children imposed on the community was emphasized by the fact that 45 of them had 326 registrations with social agencies, an average of 7 per family. This was in marked contrast to the control group in which 14 families had 16 registrations chiefly for assistance during the years of depression.

4. In the matter of health, we found that adverse prenatal factors were outstanding in the psychotic group, whereas the number of instrumental and difficult births were about equal in both groups. No doubt, the higher economic and social standards in the control group made better medical and surgical care available to these children at the time of birth and throughout childhood. This advantage may also account for the less damaging effects of the serious illnesses that occurred in rather large numbers in the control group.

5. The conflicts seen in the psychotic children centered around their violent personal relationships and sex experiences. The conflicts in the control group were chiefly concerned with school difficulties and social striving.

6. Psychic traumas contributed significantly to the mental breakdown of a large number of psychotic children. Ten of them had been shocked by the deaths of parents to whom they had retained infantile attachments. Four children were so disoriented upon learning of their adoption that they could not reconcile themselves to the true situation. Four children had lived with mentally ill mothers who were finally hospitalized. Sex traumas were reported in 14 cases of children who were overwhelmed with guilt and fear regarding masturbation. Four boys had been seduced and exploited by homosexuals. Three children were horrified by incest in the home, and 3 girls had become pregnant. Five girls were obsessed with imaginary pregnancy, having had no sex instruction except from their associates. Six children had been tormented, beaten, tied and confined by their companions so that they were terrified in the company of children, and felt safe only with adults. Two children of the control group had had similar experiences but the situations had been handled wisely.

7. The children in the control group by contrast had for the most part led happy, active and well-organized lives. In addition to school work and related activities, there were many club and other social affiliations. Most of the children had hobbies, and a number were on the editorial staffs of their school papers. Twenty boys and 14 girls were earning money outside the home. Sixteen boys were about to enter the military service, and 7 girls were helping in war activities. A large number of the children had church affiliations, and a number were active in church work. The few shy and unsocial children were gaining satisfaction by being on the honor rolls, by developing musical and artistic abilities, and by devotion to family

In conclusion, it can be said without qualification that children have the right to expect of their homes and of society the same privileges that we, as adults, demand in our lives; namely, security, justice, love and opportunity. We can readily appreciate that the psychotic children have been tragically defrauded, while the children in the control group have had their share of privileges. It is, therefore, the responsibility of all persons engaged in mental health work to see to it that children are given their rightful opportunities so that we may look forward to a reduction in the number of cases presenting symptoms of mental and nervous disorders.

THE PSYCHIATRIC ASPECT OF TESTAMENTARY CAPACITY[1]

GUSTAV ASCHAFFENBURG, M. D., Baltimore, Md.

For some forty-five years I have served as an expert in all kinds of trials in Germany and other countries. With the exception of very few cases, I have always been appointed by the courts. Thus, after I came to this country I was anxious to study the laws, statutes and courts of the United States. By comparing the functioning of American legal institutions with European ones I hoped to see in a new light many of the problems of forensic psychiatry. I was not disappointed. What impressed me most was the great difference between the rôles of the experts in America and Continental Europe. Critical opinions that have been voiced by American authors prove that psychiatrists as well as jurists have recognized the necessity of a reform of many laws and procedures.

I should like to develop my own opinion with regard to the position of the expert and in particular to the direction our efforts might take. I have selected a seemingly unimportant matter, namely the case in which the testamentary capacity is doubtful, on account of "undue influence." But it is an appropriate example to demonstrate the difference between the American and Continental European experts. Hulbert(1) enumerates three main causes as leading to the contesting of wills: (1) Fraud and forgery, (2) undue influence and (3) testamentary incapacity, considering the last one the most frequent. My large experience has taught me that most cases are based on undue influence in *combination* with deterioration of mind in old age.

But what, actually, is undue influence? The Law Dictionary of Bouvier(2) defines the term by saying what is *not* undue influence: "Influence gained by kindness will not be regarded as undue if no imposition or fraud be practiced, even though it induces one to make an unjust and unequal distribution of his property, if such disposition is voluntarily made." You know better than I how in America a seemingly well-formulated decision of a court makes law and how difficult it is to change and improve it. For instance: The McNaghten case, which this very year is one hundred years old, is still recognized as the only test of criminal responsibility, in spite of the efforts of the psychiatrists, in not less than 29 states and the District of Columbia. In a similar fashion the following decision of an English court of 1885 is accepted by all the courts of the United States: "To be undue influence in the eye of the law there must be—to sum up in a word—coercion. . . . . If the testator has only been persuaded by consideration, you may condemn . . . . although you may disapprove the act, yet it is strictly legitimate in the sense of its being legal." Reppy and Thomkin(3).

I wonder what kind of coercion is possible—threats? Starving? Corporal injuries? Blackmailing? Supposing that a testator was coerced to make a will by one of these means, the testator can withdraw it afterwards, and the man who coerced him will never know. But nothing can be compared to the influence of persuasion, of kindness, systematically and shrewdly exercised upon the testator. We psychiatrists know how much we all are influenced in our daily life by slogans, newspapers, commentators and advertisement, that is all we call, for good and evil, "propaganda." The success of the suggestion depends on the ability of the suggestor on one hand and on the other hand upon the personality of the victim. Even though in the forementioned definition it is conceded that the result of persuasion and kindness may lead to acts which may not be approved and "unjust distribution of property," the courts maintain it. Is it the task of the courts to follow a given definition rather than prevent injustice?

However interesting it may be to investigate the problem to what extent the structure of society has been influenced by the concept of property and the right or the habit to bequeath it upon somebody we like, this is beyond my present task. But it may

[1] Read at the ninety-ninth annual meeting of The American Psychiatric Association, Detroit, Michigan, May 10-13, 1943.

be useful to consider the time when a testament is actually made in order to understand why testamentary incapacity is an issue in Europe more frequently than in America.

In the United States tremendous sums are bequeathed to universities, libraries, museums, hospitals and so on, while in Europe nearly always the family of the testator inherits the greatest part of, if not the whole, property. All these institutions, except some religious hospitals, and the hospitals in England, are supported by the states, the counties or the towns. Only rarely, and then mostly during the lifetime of a wealthy man, we find something like the American openhandedness; but scarcely in the same splendid and generous degree. To make a will in America requires conscientious consideration and careful preparation. Therefore such a will is ordinarily made long before the imminent death. But in Europe people make no will at all or wait until they are dangerously ill or old of age. That, in my opinion, is why the psychiatrist is more frequently requested in Europe than in America to give his opinion on the testator's testamentary capacity, and the courts are more inclined to accept the opinions of the experts.

According to Singer and Kron(4) "it is surprising that (in America) a law requires a less degree of mental capacity to make a will than is necessary to make contracts and transact ordinary businesses." Does an average contract really ask for more intelligence and clearness of thinking? I doubt it, and I am afraid that this opinion of the testamentary capacity does not consider sufficiently the fact that the testator, when ill or aged, may be influenced by his environment. I have been appointed expert in many cases of contested wills and, nearly without any exception, the testaments had been made in old age and always they expressed more or less seriously the influence of environment. Not always unduly though; even if this term is understood in a much broader and less equivocal sense than in America. Old people are mostly disabled and more or less helpless, and depend on relatives, nurses, housekeepers or institutions which have taken care of them. And thus, the idea to show their thankfulness by their will can arise even if there is no suggestion worthwhile to be mentioned. But between such justifiable wishes and a sort of urging and eventually legacy hunting there are no sharp differentiations.

To judge the importance of the influence upon old people is an extremely difficult task, all the more so since the testator cannot be examined. Surely, laymen are scarcely able to judge it without the indispensable and unrestricted help of skilled and experienced psychiatrists.

It is common knowledge that the memory of older people begins to deteriorate. That may be the most conspicuous damage of old age; it is not the worst. Interest in the daily life and events begins to dwindle because the emotivity decreases, and often more quickly and seriously than the memory. I am afraid we often admire in old people the evenness of temper, the tranquillity of behavior, the imperturbability of mind and the seemingly superior judgment as signs of wisdom, when in reality they indicate only a lack of vital affectivity. In their routine life there are few opportunities for real and serious emotions. Therefore we find time and again witnesses who give assurance that to the best of their knowledge and belief they have never seen any phenomenon of mental disturbance except perhaps a little defect of memory. Good manners and a correct behavior are taken as a proof of mental soundness. The façade is intact, but not the house.

I would like to illustrate this with an example: The wife of a higher official asked me to examine her seventy-two-year-old mother who had been living with her for many years. The only son, living in another town, and who had never visited his mother nor written to her, had just requested to take care of her. The sister assumed that this sudden interest in the mother might be —and, as you will see, was—dictated by egotistical purposes. The mother, widow of an army officer, was the very type of a "lady"; gay, amiable, of excellent manners, with a good faculty to express her thoughts. She conceded that her memory was bad, but very cleverly she excused the defect during my examination as being due to not having slept well. The memory for past times was remarkably good, but the faculty to retain

was nearly completely lost. After having ascertained that it was a simple case of senile dementia, I asked her if she ever had made a testament and when she answered: "No," I volunteered to help her. Then I proposed to disinherit her son because he had treated her badly and to leave her property to her daughter. She signed the testament with many thanks for my help. After that I spoke to her about music and literature for about another hour and then the same procedure was repeated, only in the inverse direction. I proposed as the main heir the son despite his behavior because being an industrialist he would need the fortune much more than the daughter. The lady had totally forgotten the former will and signed the second testament too without any persuasion. The daughter sent notarized copies of the two testaments to her brother. He did not repeat his invitation. We are rarely able to examine a would-be testator ourselves. Surely it would be good to follow the suggest of Hulbert(5), namely, to make a will only after a thorough examination by a psychiatrist. I wonder if many people would be inclined to do so. Even if they were, the task for the psychiatrist would be a difficult one. We all know that whenever somebody wishes to get a certificate of his mental soundness we can safely presume that something is wrong with him. At least my own experiences have taught me to be very cautious. And I agree with Smith(6) that when we are called upon to testify regarding the state of a person who makes a will, it is necessary to investigate first of all if there is the possibility of undue influence.

Generally we must give our opinion after the death of the testator. In doing so we are restricted to the evidence given by the witnesses in court. This is a very disputable and often doubtful method when the question of testamentary capacity is discussed.

Laymen are inclined to consider a correct behavior as proof of mental health, and there are witnesses who—without prejudice—honestly believe that the testator has been sound of mind, to say nothing of witnesses who might be biased or lie or commit perjury.

This raises the question of reliability and whether the witnesses should be appraised by the expert. Under American law this is not permitted. Under Continental-European law an expert is not an expert witness, but an expert exclusively. He has the right to give his opinion about the trustworthiness of every single witness, to explain why he prefers positive findings to negative ones. He may refer to "hear-say," giving the reason why he does so; he may ask for further investigation; he may even examine the witnesses. In this country this would be considered an intrusion into the task of the gentlemen of the jury, who alone are entitled to judge the facts. But can the jury judge the "facts" correctly?

This has been doubted by eminent authorities with whom I agree fully. The jurors know little about the extreme difficulty of correct observation, the limitations of memory, the falsifications of facts due to the time element and the personality of the observer. Even a conscientious witness cannot give objective "facts," but only his interpretation of these facts.

As experts we are favored with more experience. We can compare the testimony with many other cases, principally with our observations in similar clinical cases. To prevent injustice the psychiatrist in court should be able to express himself unrestrictedly, and his position ought to be such that he can fulfill his difficult task in a reasonable and efficient manner.

I should like to summarize the position of the Continental European experts. (1) Usually the courts appoint their own experts; the attorneys have the right to chose their own experts, but this is rather an exception; (2) the court pays the expert, poorly indeed; therefore no suspicion arises that he may give his opinion in favor of one of the litigants; (3) he is an expert exclusively, sworn in with another form of oath than the witness; (4) he is entitled to ask the witness whatever questions seem to be pertinent in order to elucidate the case; (5) he can require that additional witnesses be summoned; (6) he gives his opinion mostly, and always in serious and difficult cases, in writing so that the court and the defendants may study it prior to the trial; (7) during the trial he gives his opinion by word of mouth, and he may speak to his heart's

desire. After his deposition he can be asked questions, but no "hypothetical" ones. And there are no limitations to the privilege of weighing the reliability of the facts produced, and the trustworthiness of the witnesses; (8) he is entitled to make use of the observations of his assistants, the nurses, the technicians or the results of interviews with the family; naturally the responsibility for the correctness rests with him.

The European expert has the right to express his conviction without being restricted by the fear of intruding on the right of the judge and the men of the jury in cases where he suspects "undue influence." Eventually the jury can either dismiss or accept his opinion, provided he develops properly the consistency of his conclusions. The effect is usually successful.

In 1942 the American Law Institute published an excellent Model Code(7) which may in time become the law of the country. Only then all our professional wishes will be materialized. But in order to prepare this many duties will have to be imposed upon the psychiatrists: (1) Every physician should learn at least the fundamentals of forensic psychiatry; (2) a staff of well trained and experienced psychiatrists ought to be guaranteed in order to enable the courts to chose and appoint only the best; (3) by teaching the jurists some of the psychiatric principles and concepts we may hope that the judges may gradually develop a better understanding of the problems involved and a more adequate evaluation of the expert's opinion. It has always been one of my most interesting professional duties to instruct simultaneously medical and law students as well as physicians, judges and attorneys. I have profited largely by the demonstration of cases and the ensuing discussions; and thus I acquired deep insight into the difficulties which are caused by the different methods of thinking: the deductive way of the jurist and the inductive one of the physician.

The psychiatrist should have a closer contact with the jurists. With keen pleasure I used to attend meetings of the legal faculties as a guest or even as a guest speaker. On the other hand jurists have frequently delivered papers in meetings of psychiatrists. Thus, in the course of time, a real *cooperation* has developed.

Finally, public opinion ought to be influenced and taught to understand that the requirements of the psychiatrists do not endanger public interests but rather safeguard them. Only then we can hope that laws and law administration will be adequate to the progress of our science. It will be a hard and certainly a long struggle against inveterate prejudices, but it will be worthwhile for the benefit of justice.

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AN APPARATUS FOR THE USE OF BREATH SOUNDS AS A HYPNAGOGIC STIMULUS[1]

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In the course of a study of the physiology and pharmacology of hypnoidal states(1), it became necessary to develop a method for producing a rhythmical auditory stimulus whose volume could be controlled by the observer, and whose rate would automatically conform to the spontaneous respiratory rhythm of the subject. To achieve this, the subject's own breath sounds were used.

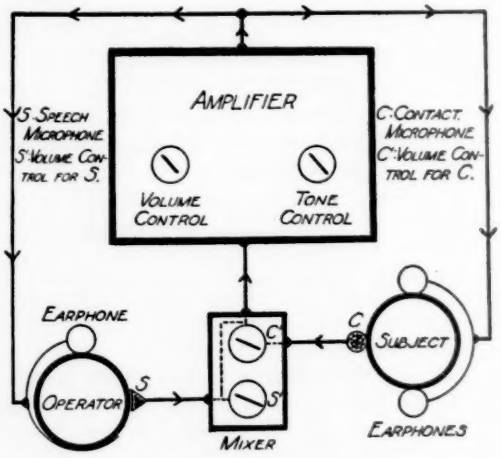

FIG. 1.

The subject wears a contact microphone and earphones. The observer wears a speech microphone and earphones. The output from both microphones is led through a mixer to an amplifier, and thence to the earphones.

The small contact microphone is applied to the neck of the subject, usually in the vicinity of the trachea. The microphone is connected through the mixer to a vacuum tube amplifier, and thence to the earphones of both the subject and the observer. The observer's speech microphone leads through the same mixer to the same vacuum tube amplifier, and thence to the earphones, so that the observer can communicate with the subject.

The subject's microphone is a crystal contact microphone, marketed under the name of "Stethophone," by the manufacturer, Shure Bros., Inc., of Chicago, Ill. The speech microphone is an inexpensive crystal speech microphone made by the same manufacturer.

The amplifier can be any standard amplifier suitable for a public address system, with a 5 to 8 watt output, and equipped with volume and tone controls.

The mixer consists of a resistor coupled pair of potentiometers in series. Through two dials, one potentiometer controls the volume of the contact microphone, and the other that of the speech microphone. From this mixer, the combined (mixed) output of the two microphones goes to the input of the amplifier. The output of the amplifier leads to the earphones.

Crystal earphones are used (manufactured by the Brush Co.). If more than one pair of earphones is used, they are connected in parallel.

This arrangement enables both the subject and the observer to hear the amplified breath sounds, and enables the observer to communicate with the subject. The method has also been adapted for recording the breath sounds, graphically, in studies of sleep and of emotional states(2).

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THE PROCESS OF HYPNOTISM AND THE NATURE OF THE HYPNOTIC STATE[1]

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I. Introduction

Science has gradually come to accept the fact of hypnotism; but adequate explanations of it are wanting still. In part this is due to a failure to recognize that there are two quite different aspects of the phenomenon to describe and to understand: namely, the hypnotic process and the hypnotic state. These differ on both psychological and physiological levels. The interrelationships between the subject, the hypnotist, and the external world are not the same during the process of induction and the state of hypnosis itself. Nor is the essential neurophysiology of the two phases identical. These differences will be considered in this communication.

Probably no definition of hypnotism will satisfy all workers in the field, especially since it is not easy always to recognize the state itself with certainty, nor to rule out conscious and unconscious simulation. It is necessary, therefore, to approximate the clarity of a definition by accurate description, by analogies where necessary, by an analysis of methods, and by measurements wherever possible. This is accepted scientific methodology even in more precise fields, and will yield at least a working definition, an hypothesis to be proved.

II. The Process of Induction

The subject who has been hypnotized many times inevitably develops certain automatic or conditioned reflexes, by which a short-cut is established to the hypnotic state. In such an individual the process of induction has lost the very features which are its essence in an untrained subject. The phenomena can best be studied, therefore, in the slow-motion picture of the hypnotic process as it takes place in a novice. It is characteristic of the onset of the hypnotic state that the subject appears to lapse into "sleep" while maintaining at least one sensori-motor contact with the outside world, and further that by the gradual elimination of other sensori-motor relationships the hypnotist becomes for a time the sole representative of or bridge to the outer world. The paradigma of this condition is the infant who is crooned to sleep in his mother's arms, and who sleeps soundly as long as the rocking and crooning persist but who wakens the moment they cease; or the individual who sleeps in a railroad train and wakens each time the train stops. In both instances, *in some way* responsiveness is reduced to every sensory inflow except one. The subject "sleeps" with one sensori-motor channel open, with one ear on the noises of the train or on his mother's voice; or as the saying goes, "with one eye on the clock." He becomes a telephone switchboard with only one plug in, or a castle surrounded by a moat with every drawbridge up but one. (*Cf.* Bierman(1).) The psychophysical mechanism of this process will be described later.

Ontogenetically the hypnotic process can be viewed as a phenomenon of regression in that it approaches the sensori-motor state of an infant in the first weeks of life. Naturally, in the hypnotic process this regression cannot divest itself completely of all that has been acquired subsequently; but the expression of all later experiences is channeled through this earlier mechanism.

According to this description, the onset of the hypnotic state can be defined as a condition of partial sleep, in which one or two open channels of sensori-motor communication are maintained between the subject and the outside world. A consideration of the full implications of this fact makes it possible to explain the transition to the fully developed hypnotic state. Aware-

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ness of self as distinct from the world which impinges from without depends in its ultimate analysis upon multiple avenues of communication. The fewer are the open channels and the more completely is the subject restricted to one avenue of impression, the less clearly differentiated will be the boundaries between his "Ego" and the external world. Thus at the outset a state is created in which each successive sensory stimulus from the hypnotist operates less and less as though it reached the subject from the outside world: instead, the incoming stimuli become indistinguishable from the self, seemingly as endogenous as the subject's own thoughts and feelings. Once the subject is going "under," it is only in a purely geographical sense that the voice of the hypnotist is an influence from the outside. Subjectively it is experienced rather as an extension of the subject's own psychic process. The hypnotist's words are the nucleus of thoughts that the subject is thinking; the hypnotist's commands become his own spontaneous purposes, even to the point of acquiring the ambivalence of neurotic conflicts. This dissolution of Ego boundaries creates a psychological state which is analogous to that brief period in early infancy in which the mother's breast in the mouth of the infant is psychologically a part of that infant far more than his own toes and hands, as much a part of the infant's Ego as is his own mouth. It is this dissolution of Ego boundaries that gives the hypnotist his apparent "power"; because his "commands" do not operate as something reaching the subject from the outside, demanding submissiveness. To the subject they are his own thoughts and goals, a part of himself.[2]

To be strictly accurate, these statements must be qualified somewhat. No single sensory modality is essential to the maintenance of Ego boundaries. In blindness and deafness, for instance, the two dominant distance receptors may be lost or may be congenitally absent without preventing the development or maintenance of a differentiated Ego. Under all such conditions, however, multiple skin and enteroceptive impulses are active: and the Ego which develops in spite of the lack of one or more sensory tools or which persists in spite of their loss, is an altered Ego. Familiar examples of this are the paranoia of the deaf and the submissiveness of the blind. A subtler manifestation is the difference between visual and auditory types.

Furthermore, in the induction of hypnosis, as in normal living, it is impossible for afferent impulses from any single sensory modality to remain isolated. The traffic which enters over the single open drawbridge quickly scatters to all of the other closed gates on its way to the center of the castle. This makes it appear to the watcher in the middle as if the internal traffic came from many directions and as though it had entered over all of the drawbridges. Thus by integration with pre-existing central pathways of association the new impressions become part of a unified experience in which the past and the immediate present are fused. In this way it comes about that in the induction of the hypnotic state the Ego boundaries are blurred both as to the outer world and as to that between Ego Past and Ego Present. The disturbance in the so-called "time sense" which occurs under hypnotism, in dreams and in amnesic states, thus becomes understandable; and light is shed on Freud's repeated statement that unconscious processes know nothing of time. As with the boundary between the Ego and the outer world, the realization of time and its passing depends upon multiple modalities and intensities of sensori-motor activity.

Many years ago the French philosopher, Etienne Bonnot de Condillac (1715-1780), recognized this erasure of the boundaries of the Ego which would occur in an individual with only one active sensory modality. In his treatise on sensation (Paris and London, 1754,(7)), he created a fantasy of a "statue" of a man who possessed one sense alone—the sense of smell. He described

[2] *Ego* is used here not in its popular meaning, but in the psychoanalytic sense to indicate that aspect of the personality of which the individual is partly conscious and partly unconscious, and which embraces the coordinated activities of the psychophysiological apparatus by means of which the individual relates himself to external realities.

The term Ego boundaries, originally introduced by Federn, refers to the boundary between an inner and outer world which evolves slowly in the life of each individual, which constantly changes, and which like the Ego itself is partly conscious and partly unconscious.

how such an individual would be incapable of recognizing objects as things which had being outside of himself, and how each smell sensation would seem to him to be himself. The statue would *be* each new odor that reached it, unable to distinguish between a source within itself and a source outside of itself. Within the limits to which the "statue" could "remember" such experiences, Condillac noted that there would be variations in the relation of activity and passivity towards experience, the statue being relatively passive towards a current experience and relatively active towards the recollection of the same odor out of the past.[3]

Evidence for this point of view is seen in many well known psychological facts. For instance, in daily life the degree of organization of sensory data constantly delimits the boundary between imagery and hallucination, which is another aspect of Ego functions. In dreams we accept as normal the occurrence of visual and auditory images of hallucinatory vividness; but it is in sleep alone that it is "normal" to have such hallucinations—to wit, only when the corrective and comparative data from distance receptors are not active. In contrast, during waking states even the most normal individuals can have varying degrees of hypochondriacal illusions or hallucinations; because proprioceptive sensations from the body lack the clear definition of those which are mediated by the exteroceptor apparatus, and therefore are less able to correct the pseudo-sensory creations of the imagination.

Thus the restriction of sensori-motor relationships, which is the nuclear phenomenon of the induction phase of the hypnotic process, explains both the apparent suggestibility of automatic passivity, and the intensity of the sensory components of the images and memories which subsequently may flow through the mind during moments of hypnagogic reverie. In this state, as in dreams, emotional and sensory images out of the past are revivified with undiluted intensity because of the lessened opportunity to make comparisons with actual concurrent sensations.[4] Furthermore, whereas in dream states the sensory data are almost exclusively those of the projective distance receptors (*i.e.*, visual and auditory), in hypnagogic reveries, olfactory, gustatory, tactile, and kinæsthetic memories can likewise escape all customary repressive influences and therefore are experienced with exceptional vividness. (*Cf.* Silberer(22), Moore (19).) This seems to open a pathway to many otherwise inaccessible memories. (Kubie and Margolin(16).)

Such an obscuring of Ego boundaries, so dramatic in its manifestations when it is total, is frequently encountered in normal psychology as a partial phenomenon, the manifestations of which are subtle and elusive. In this form it is of universal importance in the developmental processes of childhood, in normal dreams and reveries, and in the ceaseless influence of unrecognized automatic patterns in normal life.

In other respects as well, the induction of hypnosis seems to be an exaggeration of but not a departure from normal behavior, and is dependent upon no abnormal mechanisms. Indeed it can be looked upon psychophysiologically as nothing more than a function of maximal attention, although reached rarely and only under special conditions, a phenomenon which could be predicted by extrapolation from the observation of better known everyday occurrences. Its mechanism has been described by Pavlov as the formation of a concentrated excitatory focus in the central nervous system, with surrounding areas of non-excitatory processes—or, as Pavlov would call it, of inhibition (Kubie(15).)

III. Physiological Factors in the Induction of the Hypnotic State

The basic physiological prerequisite for the induction of the hypnotic state is the creation of a focus of central excitation with surrounding areas of "inhibition" (or "non-excitation"). In turn, this depends upon two related factors, (1) relative immobilization, and (2) a monotonous stimulus of low

[3] This comment on the relative degrees of activity and passivity in remembering and experiencing, respectively, is of considerable interest to analysts.

[4] An incompletely defined or integrated experience creates a kind of vacuum which can be resolved by additional perceptual values either by unconscious synthesis or conscious exploration.

intensity, either continuous or rhythmical. Although physiological fatigue-products may play a rôle in altering various significant thresholds, too little is known of their influence to warrant discussion of them at this time.

1. THE FACTOR OF IMMOBILITY

The fixing of the subject's eye on a single point, which traditionally has played such an important rôle in the melodramatics of hypnotism, has a valid physiological basis. Pavlov showed that the "exploratory" or "investigatory" impulses of animals are basic in maintaining a state of general alertness, and that any interference with them is the first step towards the induction of the hypnotic immobilization which is described by all who work with animals, both in animal husbandry and in the experimental laboratory. Whether it is the immobilization of sheep for shearing, of the hen by holding its beak to a chalk line, or of a dog or a pig in a Pavlov frame, all have this factor in common. (*Cf.* Byrne(5).)

In the human subject the eye has replaced the nose and head as the exploratory and investigatory organ; and the prolonged, voluntary fixation of the eye on a single point is physiologically homologous to the immobilization of the whole head in lower forms. When at the request of the hypnotist the human subject fixes his eye on one spot, he figuratively speaking takes himself by the back of the neck and immobilizes himself. Thereby he produces a state of relative inhibition (or at least a reduction of excitation) not in the segmental oculo-motor apparatus alone, but also in the supra-segmental levels which play upon it, and therefore in the entire sensori-motor apparatus which adjusts the human body to the roving and exploring activities of the eye.

At the same time fixing the eye on a single spot reduces the visual input to a low, continuous monotone. The eye sees only one spot; just as the ear hears only a droning voice or sound. This simultaneous restriction both on the motor and sensory side reduces to a minimum the variegated sensory contrasts upon which Ego boundaries depend.

2. THE FACTOR OF MONOTONY

Both the conscious perception of sensation and all conditional and unconditional responses to afferent stimuli are dependent upon changes in the stimuli themselves. "Monotony" is not merely a psychological concept with emotional connotations. It is at core a physiological fact in which the phenomenon known as "sensory adaptation" plays the initiating rôle. Sensory adaptation is created in any receptor organ by a stimulus of constant intensity which continues without interruption beyond a certain time, or by a stimulus of constant intensity which is discontinuous but which has a constant rhythm. Physiologically, sensory adaptation is a state of equilibrium in the sense organs which can be altered only by changes in stimulus intensity or in the metabolism of the organ itself. Both in amplitude and in rate these changes must exceed certain minimal limits which can be quantitatively determined. Psychologically, sensory adaptation is manifested by a diminution both in the subjective awareness of the stimulus and in the responses and reflexes which are normally associated with a similar stimulus of perceptibly fluctuating intensity.

The phenomenon of sensory adaptation has been demonstrated in man and in other species for practically all sensory modalities: *e.g.*, vision (Hecht(10)), hearing (Knudsen(14)), smell (Zwaardermaker(23)), touch (Weber-Fechner (*cf.* Dallenbach(8)). Everyday experience makes us aware of this in the adaptation to odors, to posture, to the pressure of clothes, etc. The same phenomenon is also observed in organs which are under autonomic control, such as the bladder, rectum and stomach. In daily life this is familiar through the fact that heartbeats and respirations are perceived only when their rhythms change, and acutely only when a dysrhythmia occurs.

These considerations permit the conclusion that sensory adaptation is one of the physiological prerequisites to all sleeplike or hypnoidal states. In other words, the sensory receptors must be exposed either to continuous stimuli of constant intensity or to discontinuous stimuli in a rhythmic pattern.

Rhythm is thus seen to be a significant physiological factor in the induction of sensory adaptation, in addition to its psychological importance in emotional states and in the general field of æsthetics. It can be said that a steady rhythm endows a stimulus with a quality of predictability, which in turn creates an unconscious attitude of relaxed and secure expectancy. Especially where, for any reason, distance receptors cannot warn us of things to come, rhythm plays a relaxing rôle of heightened significance. This is seen in the process of falling asleep. It should be worthy of special study in those who are deaf and blind. The impact of an expected stimulus is not as disturbing as the impact of the same stimulus when it is unexpected. We can strike ourselves rhythmically and experience no pain, whereas if someone else strikes us unexpectedly even with less force, the sensation of pain can be acute, and the attendant emotional overflow severe. Jacobson(12) and Miller(18), in testing the reactions to electrical shocks during various stages of relaxation, found a diminution in the subjective awareness of pain proportional to the degree of relaxation. Partly through the sense of predictability which derives from it, rhythm gives rise to a feeling of security against the unexpected, creating a barrier against the startle pattern. It influences centrally the physiological threshold at which sensory adaptation can be broken through. These facts have been demonstrated in much of the experimental work on the influence and recognition of rhythm. The rhythmically recurring words and gestures of the hypnotist play a similar rôle, and act both peripherally and centrally.

This makes it clear why it is difficult for one hypnotist to step into the rôle of another in the midst of a seance; since changes in voice, in intonation, in rate, accent and enunciation, will usually tend to disrupt the constancy and rhythm of the stimulus thus rousing to a sudden alert the sleeping sentinels of the sensory system.

Universal sleep customs also demonstrate that both of these components of monotony (that is, rhythm and the induction of sensory adaptation), are important precursors to sleep. Light adaptation occurs through the use of a dark room, through closing the eyes, or through the presence of low, steady illumination. Rhythmically flickering or flashing lights also produce light adaptation and will not disturb or prevent sleep, whereas irregular light flashes can make it impossible. Adaptation to sound is produced by sleeping in a hushed room, by the nightly diminution of the daily roar of noise, or by sleeping in a room in which whatever noises may occur are likely to be accustomed and expected. Adaptation of the receptors for deep sensibility and for tonic and postural stimuli, is achieved by lying down so that support is provided for all parts of the body as the bed molds itself to the body's shape and weight. Finally, adaptation of epicritic and temperature sensation is achieved by wearing night-clothes, bed coverings, and the like.[5]

Conversely, the physiological nucleus of a state of alertness or wakefulness is found in a lack of adaptation of the sensory modalities, which allows the organism to orient itself to its environment with as much of its perceptual mechanism as can be brought into play. Again in the mobilization of this state of "alert," one finds a subtle interplay of physiological and psychological forces. The latter tend to be more or less specific for each individual, and depend upon the

[5] "I would like to suggest that there is no great dissimilarity between so-called sensory adaptation of the peripheral organ (which is, if you will, a negative adaptation or extension of the response of that organ due to the lack of variation of the stimulus), and the same thing within the central nervous system, due to rhythmicity of stimulus. From the functional organization of the nervous system there is every reason to believe that unvarying rhythmicity of stimulation necessarily involves the repeated action of the same portions of the nervous system, and this at intervals sufficiently short to cause at least a rise in thresholds to stimulation from that source. It is, by another means, exactly what we worked on so long with electrical stimulation of the cortex, calling it 'extinction of response.' Here the repeated stimulation of the same point resulted in a disappearance of the response. I think you would be completely justified in regarding adaptation of the sense organ and adaptation of the central nervous system—the one to monotony, the other to rhythmicity—as two spacially separated but functionally like processes, to be accounted for principally by the factors for extinction already known in the central nervous system." (Personal communication from Dr. Warren S. McCulloch.)

manifold associations which give life and meaning to the sensory impulses which penetrate through the peripheral barrier of sensory adaptation. The noise of city traffic will disturb the sleep of the man from the country: barnyard noises will waken the visitor from town. For any individual, therefore, specific complex sensory experiences can be divided into those which produce tension and thus increase the state of physiological and psychological alertness, and those which diminish tension and lessen this state.

Furthermore, monotony exercises a cumulative and increasing influence on the activity of the organism. It has been demonstrated that the longer a state of monotony is maintained, the greater is the minimal change in the peripheral stimulus which is required to disrupt the state of sensory adaptation. Numerous observers have noted the hypnagogic effect of sustained monotony: *e.g.,* Sidis(21), Pavlov(20), Lovell and Morgan(17), Kleitman(13), Jacobson(12), Bolton(2), Cannon(6), Heubel(11). Sustained monotony produces a state of functional de-afferentation of the cortex comparable to that which was produced surgically in Bremer's(3) experimental demonstration that when high cervical section and section of the cranial nerves deprives the cerebrum of all afferent influences, the cortex yields electrical activity potentials identical with those obtained in sleep.

Finally, it should be clear that except where it has been secondarily incorporated into a conditioned reflex, the hypnoidal state can never result from the physiological influence of the adaptation of one sensory modality alone. Discussions in the literature, which emphasize the hypnagogic influence of one monotonous factor over another, consistently neglect the fact that multiple modalities are always involved, and that the hypnagogic state varies with the successful adaptation of the various sensory mechanisms. Relaxation or immobilization is not a simple physiological situation characterized exclusively by lack of movement. A steady state for all sensory modalities is involved in its maintenance; and this must be mediated through reflex and acquired endogenous psychological factors.[6]

IV. Emotional Factors in the Induction of the Hypnotic State

Proprioceptive stimuli can be intrinsically pleasant or painful. On the other hand, exteroceptive stimuli acquire primary emotional significance either by warning of the imminence of pain (danger signals), or else by promising pleasure (pleasure signals). It is usually taken for granted that the response to exteroceptive signals depends

[6] Some time after an accumulation of preliminary data had led to the formulation of the viewpoint expressed herein, a monograph by Boris Sidis came under our consideration, entitled "An Experimental Study of Sleep" (1909)(21). This remarkable publication describes a series of experiments on the induction of sleep in frogs, guinea pigs, cats, dogs and children. Sidis characterizes the conditions necessary for the induction of sleep as the "conditions of monotony," and pointed out that "limitation of voluntary activity, limitation of the field of consciousness and inhibition all help to a greater monotony" (page 54). Up to this point Sidis' formulation and our own are strikingly similar.

In keeping with the attitude towards instincts current at the time, Sidis regarded sleep as a "biological instinct, as much as hunger and sex" (page 98); and analyzed the underlying physiological and psychophysiological processes into three component phenomena: (1) "cell energy," with sleep regarded as the anabolic phase of a metabolic cycle; (2) "threshold," with sleep resulting when stimulus thresholds rise above the level of perception; (3) "stimulus exhaustion," a state of non-reactivity of a receptor or effector due to monotonous stimulation. The work of Sherrington and Weber provide the data for most of these concepts (pages 75-90).

Interwoven with the discussion of the experiments on sleep runs a thread which if it had been developed fully might have proved to be of great significance. This was Sidis' application of "immobilization" and "monotony" to psychotherapy. He induced the hypnoidal state by monotonous reading, singing or metronome beats. After a time he asked the subject . . . . "to tell what came into his mind . . . . during the reading or immediately after" (page 15). This is of special interest to us as any early parallel to the work recently reported. (Kubie and Margolin(16).) Had Sidis correlated these observations with the early observations of Breuer and Freud, and with the developing body of psychoanalytic theory and technique, he could not have failed to exert a profound influence on the evolution of psychotherapeutic technique.

upon a state of what is called "alertness"; but Pavlov has shown that alertness itself depends upon other factors: notably the tension of instinctual cravings, and the fate of previous similar signals in the life history of the animal. Thus, if an animal is satiated, or if the "promise" is never fulfilled, or if pain finally cannot be overcome or avoided, the reaction may become reversed and the same signal will induce drowsiness. It is in this manner that experience can so play upon and alter the conditioned emotional organization of any animal as to increase, decrease or reverse the hypnagogic value of any stimulus or of the manipulations of a would-be hypnotist.

Therefore, attentiveness to exteroceptive stimuli comes to have a complex significance in all animal forms. To withdraw attention from such stimuli implies either a state of satiation, or a retreat from painful tension, or else a sense of security that reaches to the deepest unconscious layers of the personality. The latter state is the goal of the hypnotist.

Wittingly or unwittingly, the melodramatic maneuvers of the old-fashioned hypnotist were designed not merely to immobilize the subject and to create monotony and sensory adaptation in general, but through the operation of these forces to *concentrate his attention on one field of sensation and to withdraw attention from all others.* To accomplish this, many tricks and devices had to be used in order to overcome the anxieties and resistances of the subject, to play upon his passivity or his aggressiveness by bribery, teasing, trickery and intimidation, and to side-step all automatic reactions of anger, fear and depression. Whatever the devices, the goal was always the creation of an emotional state in the subject in which it would become possible for him to abate the normal attitude of diffuse alertness and allow his sensory sentinels to doze. Only rarely can a subject do this if he is in a state of anger or anxiety, whether this be conscious or unconscious. Therefore, the hypnotist in the laboratory or on the stage has to adjust himself to his subject's feelings so as to circumvent these emotional obstacles. It is just here that the play of conscious and unconscious forces in the personality of the subject, and his consequent reaction to the manner, voice, appearance or maneuvers of the hypnotist exercise a fundamental contributory rôle.

This concept of the hypnotic process makes it possible to explain the consciously willing subject who nevertheless cannot "go under," and conversely the consciously resistant subject, who succumbs readily if the hypnotist exploits the deliberate opposition of the subject by allowing him to use the hypnotist as though the hypnotist were an instrument of the subject's will, thus evading the anxiety which is evoked by maneuvers which demand of the subject a greater show of passivity.

Irrespective of any special theory of how this is achieved, it is evident that the progressive diminution of the internal responses to sensory signals automatically reduces that share of internal tension which depends upon sensory inflow. But in order to become able to reduce his alert attentiveness to the warning signals which sensory stimuli provide, an individual must feel at least as secure as he ordinarily feels when he retires to bed. Thus it is not an accident that bed itself (and for many people it must be a familiar and accustomed bed) is an important conditioned stimulus for sleep. The hypnotist must somehow induce in the subject a freedom from disturbing affects, identical with the emotional relaxation which signals the approach to normal sleep.

That in any individual who has been hypnotized repeatedly the hypnotic state can be induced almost instantly by the mere presence of the hypnotist is not surprising, because the hypnotic reaction becomes a complex conditioned unit in the total Ego-*Gestalt,* an organized Ego-fragment into which the individual can be thrown in a flash, just as the patient with a specific phobia can be thrown into a panic by the appropriate danger signal.

V. The Nature of the Fully Developed Hypnotic State

As the process of inducing the hypnotic state achieves its goal, a remarkable and highly significant change occurs. The subject again becomes able to communicate freely with the outside world. He reestab-

lishes the boundaries of his ego both in time and place at least partially, and towards everything and everyone including the hypnotist. At the same time the hypnotist becomes partially engulfed within him ("incorporated"), almost as an amœba flows around a food particle by re-expanding the pseudopodia which it has first withdrawn and then put out again. At this point, therefore, we must explore the significance of this change from the process to the state, and attempt to describe and explain it.

During the process of inducing hypnosis, a constellation of conscious and unconscious attitudes arises between the hypnotist and the subject, in which manifold libidinal displacements and substituted object relationships (*i.e.*, transference phenomena) are active. When the hypnotic state is fully achieved, an extensive carry-over occurs from this pre-hypnotic relationship into the content of the hypnotic state, comparable precisely to the carry-over into the content of any dream of the residues from the emotionally incomplete experiences of the preceding day (the so-called *"Tagesrest"*). This has recently been demonstrated experimentally by Farber and Fisher(9) in their studies of dreams under hypnosis. As a consequence of this carry-over of transference values the hypnotist means many things at one and the same time to different levels of the subject's personality. Of these many meanings, those which are most highly charged are expressed in the productions of the subject while under hypnosis. It is this that gives rise to such over-simple terms as "mother hypnosis," "father hypnosis," etc., which Ferenczi introduced(24).

Because he represents so many important figures and fantasies out of the subject's life, during the prehypnotic maneuvers the subject transfers to the hypnotist many highly charged feelings. These feelings dominate the relationship during the process of induction; but the specificity with which they are carried over into the hypnotic state itself, how far they may be altered or obliterated in the trance, or how active a rôle they play in the thoughts, words or conduct of the subject once he is "under," are problems which have not been adequately studied; and theories of the importance of maternal and paternal types of hypnotic relationships still have an undetermined relation to the hypnotic state, although they apply with some precision to the pre-hypnotic maneuvers of the hypnotist in his effort to initiate the hypnotic state.

These terms are further misleading, in that the carry-over from the prehypnotic transference relationships are not the essence of the hypnotic state itself any more than the *"Tagesrest"* is the essence of the dream. In hypnosis, the residual stresses derived from recent experiences (here, this is the hypnotist) are subjected to the influence of the familiar mechanisms of condensation, substitution, etc., as in the so-called "dream work," and in both states these mechanisms provide an avenue of access to earlier material. However, if the hypnotic state could be produced without the use of any personal pre-hypnotic maneuvers, the hypnotic subject's thought content would then arise solely out of the depths of his own personality.

In yet another respect the hypnotic state differs basically from the process of induction, in that once he is fully hypnotized the subject need not remain silent, inert and apart. If appropriate words from the hypnotist engender corresponding purposes in the subject, he will walk around, converse intelligently, and in general make it evident that his sensori-motor horizons have re-expanded, seemingly to their pre-hypnotic limits. Furthermore, after the induction process is complete, the hypnotist no longer functions as the only channel of communication between the subject and the outer world. Instead, he becomes something which the subject carries around inside of him—a secret "will," or purpose—a "still, small voice of conscience"—an unconscious component of the new personality which has emerged. In this phase, the thread by which the subject remains tied to the hypnotist becomes hidden. He is led by it, but he is not aware of it, and he scotomatizes all experiences which might force it upon his attention.

Evidently, in the hypnotic process the subject recapitulates in a few moments or hours the most important and complex psychological evolution of infancy. In this process, parental figures are at first the only

avenue of communication with the world, and are therefore an integral part of the infant Ego because of the lack of clearly defined Ego boundaries. Subsequently they are in part dissociated from the infant and in part even more deeply buried ("incorporated") in the unconscious levels of the personality. Similarly the hypnotist who begins as a part of the subject, subsequently is partly disowned, the subject conversing with him on an impersonal level as though he were any casual companion. At the very same time, however, on a still deeper level, the subject is living, thinking, feeling and acting at the behest of the secret voice of the hypnotist which he carries within him. It is this voice which echoes the spoken words of the real hypnotist, turning them into the subject's own purposes. Thus the hypnotic process parallels with singular precision the development of the relationship of the infant Ego to the adult parental world.

Yet just as it is never the actual parent but an image of the parent, so it is not the hypnotist, himself, but a complex image of the hypnotist which becomes part of the subject. This image functions in the subject as does the residue of parental images in adults. It delimits memories and contacts, dictates purposes, distributes inner rewards and inner punishments, and engenders strong affects. In some measure, therefore, it temporarily dispossesses the earlier authorities (*i.e.*, the superego), or merges with them.

Furthermore, it is precisely this which is at the root of the phenomena of dissociation and of multiple personalities, each erected around the nucleus of its own parental or pseudo-parental images. In hypnosis the change of this nucleus creates the altered personality in the hypnotized subject; for the apparent or effective Ego can assume before the world only that rôle which the buried residues of hypnotic pseudo-parental authority will allow. It is evident also that the buried (incorporated) image of the hypnotist becomes an experimentally induced superego figure. The opportunity which this presents for the study of this process is unsurpassed. (*Cf.* Brickner and Kubie(4).) This may mean that a successful hypnotic relationship is an essential ingredient in any successful psychotherapy if psychotherapeutic processes are ever to succeed in dislodging the earlier incorporated superego figures from their all-powerful positions.

Thus in the transition from the process of induction to the fully achieved hypnotic state, certain qualitative changes take place. Through these changes new boundaries are formed between the Ego and the outside world; but the boundary between the past and the present remains indistinct. That which is immediately perceived is fused and integrated with older constellations of perception and association. Thus, patterns and experiences are formed which are psychologically specific for each subject; and the hypnotized individual becomes in no sense an automaton. The sense of continuity of the conscious processes preserves for the subject the sense of integrity of his own Ego. He has no feeling of dissociation, no sense of superimposition of another's will. Without knowing it, he has merely acquired an altered Ego and an altered superego.

This viewpoint has been set down dogmatically, as though it were self-evident, and as though it were the only possible interpretation of the known facts. To us it seems that clear. Yet we must admit that evidence for it is only fragmentary because it has never been sought systematically. Some of it is found in the experimental work of Fisher and Farber(9) already mentioned; some of it in the earlier studies to which they refer, and some in the classical studies of Sidis to which reference has been made. Among current writers on the theory of hypnotism, the viewpoint which is closest to the one put forward in this communication will be found in White(25) and White and Shevach(26). These papers are valuable for their critical and penetrating reviews of the development of the theoretical understanding of hypnotism and for their bibliographies.

Finally, if this picture is accurate, the hypnotic process can be seen to consist of a seemingly opposite pair of phenomena: first, during the induction process, a state of maximal attention to one group of stimuli, combined with an obliteration of all others, which results in a loss of Ego boundaries and an incorporation of the hypnotist in the subject. Later, in the fully developed stage,

a diffusion of sensori-motor relations occurs with a retention of a dominant but repressed link to the hypnotist by the incorporation of a fragmentary image of him in the re-expanded borders of the Ego. In a less exaggerated and therefore less dramatic form the same paired opposites occur together in the everyday experience of growing up, and again in the psychophysiological phenomenon of normal attention. In hypnosis this is sharply intensified by special conditions; but it is evident that such an extension of a normal process should be attainable by simple physiological procedures, without the agency of suggestion, or even of any human contacts. Evidence to support these statements and a description of the essential experiments will be presented in a subsequent communication.

In dissolving the hypnotic state it is evident that the incorporated image of the hypnotist must be dislodged. A discussion of how this is achieved, and how this in turn is related to the psychotherapeutic process in general must be reserved for another communication.

Summary

1. The process of inducing hypnosis and the fully developed hypnotic state are a continuum which can be studied satisfactorily only in the novice, and which under such circumstances consists of three stages which shade from one into the next.

2. In the initiation of the process there is a progressive elimination of all channels of sensori-motor communication between the subject and the outside world, with the exception of the channels of communication between the subject and the hypnotist. As a consequence, during this phase the hypnotist becomes temporarily the sole representative of and contact with the outside world.

3. In this essential characteristic, the induction phase parallels the sensori-motor relationships of the infant to the outside world during the earliest phase of infancy, during which the parents play in the psychology of the infant a rôle almost identical to that of the hypnotist in the mental life of the subject.

4. The onset of the hypnotic state consists of a partial sleep in which active sensori-motor channels are restricted to those between the subject and the hypnotist.

5. This reduction of sensori-motor channels obliterates the Ego boundaries of the subject and constricts them, which makes inevitable a psychological fusion between hypnotist and subject.

6. This constitutes the second phase in the process, one in which a fusion of subject and hypnotist is achieved, with the result that to the subject the words of the hypnotist become indistinguishable from his own thoughts. It is this in turn which makes possible all of the phenomena of *apparent* passive suggestibility.

7. At the same time, this same restriction of sensori-motor relationships induces and makes possible states of hypnagogic revery in which vivid sensory memories and images are released. These images and memories include olfactory, gustatory, tactile, and kinæsthetic modalities of sensation which are not ordinarily easily recalled or vividly imagined.

8. The sensory vividness of these reveries in turn opens the way to buried memories, and particularly to the buried affects which are related to such sensory memories.

9. Physiologically the hypnotic process is shown to be an extension of the processes of normal attention, the result of the creation in the central nervous system of a concentrated focus of excitation with the surrounding areas of inhibition (in the descriptive Pavlovian sense).

10. In turn, this is dependent physiologically upon:

(a) Relative *immobilization* through the immobilization of the head or eye.

(b) The *influence of monotony.*

11. Initiation of monotony depends upon *sensory adaptation,* which in turn is in part dependent upon *rhythm.*

12. Psychologically the creation of the hypnotic state, with its focus of excitation within limited areas, depends upon a diminution of alertness through allaying anxiety and other defenses, a process which is a necessary prerequisite to the suppression of sensory warning signals.

13. The shift to the fully developed final phase of the hypnotic state involves:

(a) A partial re-expansion of ego boundaries.

(b) An incorporation of a fragmentary image of the hypnotist within the expanded boundaries of the subject's Ego.

14. In this final phase the compliance of the subject to the hypnotist's commands is again more apparent than real, in that the incorporated image of the hypnotist which echoes the hypnotist's voice has for the time being become a part of the subject's temporary Ego.

15. It is obvious that the final phase in the hypnotic process, which occurs with the full development of the hypnotic state, parallels precisely that phase in the development of the infant's Ego in which its boundaries gradually expand, with the retention of parental images as unconscious incorporated components of the developing Ego of the infant. The incorporated image of the hypnotist plays the same rôle in the hypnotic subject as does the incorporated and unconscious image of the parental figure in the child or adult. Hypnosis thus is seen to be an experimental reproduction of a natural developmental process.

16. The use of hypnosis in some form may conceivably be necessary, therefore, for the complete therapeutic displacement of disturbing superego figures which are retained out of childhood.

17. In the hypnotic process mechanisms are at work identical with those seen in the dream (such as transference, displacement, condensation, etc.). Much has been made of these in the literature; but they are not the essence either of the process or of the state itself.

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REPORT OF A SURVEY OF NURSING IN MENTAL HOSPITALS IN THE U. S. AND ONTARIO, CANADA[1]

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Antedating the present critical emergency by a period of several years, the nursing committee of your Association has been greatly concerned by the outlook of the nursing care for patients in mental hospitals. The supply of adequately trained nursing personnel appeared to be decreasing, while the patient load, on the other hand, undoubtedly is increasing. In the simplest terms, this means disaster. Therefore, the Committee on Psychiatric Nursing sought aid from the Rockefeller Foundation in order to study the situation, ascertain the facts, and if possible, make recommendations to offset some of these difficulties. A grant was generously authorized by the Rockefeller Foundation and the work was begun July 1, 1942.

The first year of a three year program is being spent in a survey. Naturally in this period of time it is not possible to attempt a visit to all mental hospitals. Hence a sampling has been made.

The number of hospitals visited has been 61—in 25 states and the Province of Ontario, Canada. Of this number, 49 were state hospitals, 5 private hospitals, 5 psychopathic divisions of general hospitals, and 2 institutions for the mentally deficient. These hospitals or departments varied in size from 16 beds to 9,964. Geographically, they have ranged from Canada to Florida, and from the East Coast to the West Coast.

The ratio of registered nurses to patients in the total group was from 1 to 3.1 to 1 to 2,864. The ratio in the state hospitals of the United States averaged 1 nurse to 123.967 patients. The ratio of registered nurses to patients in the Ontario mental hospitals averages 1 to 34.56.

The total nursing personnel, including graduate nurses, student nurses (both undergraduate and post graduate), and attendants, shows the following range: 1 to 2.12 to 1 to 21, the average in the United States being 1 to 11.829. Average for state hospitals—1 to 12.22.

Funds

The quality of the care of mental patients, like any other commodity, is to a great extent commensurate with the price paid. To be sure, there are those who are better managers, who can get more value from the dollar spent than others, and there are also certain aspects of understanding that go far beyond the power of money to buy. However, as in nations, states or families, a basic level of living is determined by the wealth of the unit. This fact, it is believed, has not been given the consideration necessary to promote a desirable standard of patient care in the average tax supported hospital.

At this time many problems, such as inadequacy of nursing personnel both in quantity and quality, are probably greater than ever before in the history of our mental hospitals as a result of the national emergency. This no one will dispute, but many of the problems now intensified have their roots in the fundamental issue of lack of appropriation existing long before this crisis. I refer to hospitals that have never had a sufficient staff of graduate nurses, and other parallel deficiencies. The poor salaries paid in mental hospitals, the long hours and poor living conditions have not been conducive to attracting personnel. This is not the fault of the hospitals, per se, but indicates a lack of knowledge on the part of the public of the needs of mental hospitals. For many years, during the period when there was so little to be done for mental patients except to give custodial care, an efficient administration was considered to be one in which costs were kept at a minimum. The increase in appropriation has not kept pace with the increase in therapy available. One progressive superintendent stated that there was no appropriation for his hospital to give insulin therapy. Yet he realized its potential value. By appealing to some of the citizens of his community he was able to equip and open a

[1] Read at the ninety-ninth annual meeting of The American Psychiatric Association, Detroit, Michigan, May 10-13, 1943.

30-bed ward for carrying on this work. This, while only one instance, shows the eagerness of the public to promote good care for its mentally ill, if educated to the possibilities. Many laymen, unfortunately, still look upon the mental case as a hopeless one, and with our knowledge to the contrary, are we not to some extent to blame if we fail to awaken them? This, it seems, might be a challenge to the members of the state psychiatric societies, who as individuals have their roots in the soil of the communities. This survey has revealed in one state hospital, per capita costs of as little as $14.88 per month for the biennial period ending June 30, 1942. Are we going to accept that as adequate? In this same state the cost per capita for the same period as reported for the state penitentiary is $21.89.

Table 1 gives the per capita cost of patient care for the various states and the District of Columbia for the year 1939. Data have been tabulated for the years 1940 and 1941, but these figures are not available until released officially by the Government. It may be of interest to this audience, however, to know that in the face of rising costs in 1941, 17 states showed a drop in the cost of patient care from the figures given here for 1939. Therefore, it may be assumed that the situation is not improving.

Personnel—Attendant Courses

The war has made inroads upon the personnel of the mental hospitals in all brackets from the highest officer to the lowest domestic help. One hospital having under normal conditions a staff of 52 registered nurses, had 22 on the day of visit, and another had dropped from 72 to 38. However, it is apparent that the institution having the better staff prior to the emergency will make the best adjustment. The level of patient care will inevitably fall, but it is obvious that it will be above that in hospitals less well prepared at the beginning. For instance, with the loss from 52 to 22 nurses mentioned above, this hospital has a ratio of registered nurses to patients of 1 to 92.6. This is a better ratio than many of the state hospitals had prior to the present emergency, and above the average for the United States.

Not only in numbers, but in training as well, is this lack of uniformity apparent. For instance, in the field of attendant training there is a wide discrepancy from state to state and even between hospitals within

TABLE 1

Comparison of the Annual Cost of the Maintenance of a Mental Patient in the State Hospitals of the Various States for the Year 1939

(From U. S. Department of Commerce, Bureau of the Census)

Average Maintenance Cost for the U. S.	$299.20
1. District of Columbia	$654.37
2. Wisconsin	572.17
3. Michigan	505.34
4. Massachusetts	420.18
5. New York	413.12
6. Delaware	383.10
7. New Hampshire	372.91
8. New Jersey	372.73
9. Connecticut	343.31
10. California	308.31
11. Rhode Island	307.63
12. Vermont	296.72
13. South Dakota	284.33
14. Arizona	281.87
15. Missouri	280.69
16. Pennsylvania	279.26
17. Maine	273.24
18. Nebraska	269.32
19. South Carolina	266.71
20. Colorado	264.86
21. North Dakota	263.22
22. Florida	261.39
23. Illinois	255.47
24. Nevada	254.86
25. Utah	249.99
26. New Mexico	245.90
27. Idaho	242.03
28. Maryland	239.31
29. Washington	239.19
30. Minnesota	227.20
31. Wyoming	217.85
32. Montana	215.29
33. Oklahoma	215.27
34. Texas	212.29
35. Indiana	208.72
36. Kansas	206.19
37. Georgia	204.08
38. Iowa	195.92
39. Ohio	191.36
40. Louisiana	189.59
41. Virginia	182.87
42. Alabama	182.26
43. Arkansas	181.59
44. West Virginia	179.51
45. Mississippi	164.03
46. Oregon	163.68
47. Tennessee	163.58
48. North Carolina	161.52
49. Kentucky	132.41

the state. Some have no program of training whatsoever. Each new employee is given his assignment and learns as best he can on the job. This apprenticeship system is time-consuming and leads to a variety of techniques. On the other hand, some of the courses are quite long and involved, with curricula inappropriate to the status of the position or the duties to be performed. A very careful study is being made of the material which has been assembled relative to the training of this large group of workers. It is proposed to work out a course which will be feasible and advantageous to the employee, the hospital and the patient. It is believed that such a measure would lift the standard of nursing care generally. Does this not seem reasonable, when the objective of good care for mental patients is a universal one, common to all mental hospitals? It has been shown by some that it can be done. Why not by all?

Three Year School

During the last 15 years there has been a tendency to discontinue basic schools of nursing in mental hospitals. It was thought that the mental hospital could function best as a laboratory for clinical experience for affiliations from the general schools and in the field of post graduate work. While these two phases of nursing are highly important, they do not meet the need of furnishing to the mental hospital an adequate supply of graduate nurses. With an affiliation of from two months to four months, and the latter is the exception, the usual course being a three month period, the student does not get much more than an appreciation of the subject. Many affiliates are overwhelmed by the enormity of the problems without the satisfaction that comes from seeing the results of their efforts. Therefore, while this method enriches the background of the nurse for general hospital work, it does not as a rule make her eager to follow psychiatric nursing upon graduation. Data collected in this survey show that in the 40 state hospitals visited, 28 of the nurses in key positions, that is, the Director of the Nursing Service, or Principal of the School of Nursing, or both, were graduates of schools in mental hospitals.

When this present group will have passed on, where will others be found to take their places if these schools in mental hospitals continue to close at the present rate? It is recognized that every mental hospital cannot, nor is it desirable that they should, conduct a school of nursing. However, it is hoped that those best situated and equipped to do so, will keep in mind the necessity of carrying on this work if we are to maintain a level of nursing for the mental patient that compares at all favorably with the standard of care of the patient in the general hospital.

Student Training

The preparation of nurses in the psychiatric field has not kept pace with the growing demand and it is unquestionably true that this demand will increase with the mounting mental casualties of war, not to mention the acceleration of mental illness in the civilian population.

Although psychiatric patients are to be found in every state, with a few minor exceptions psychiatric nursing has not been considered essential to the preparation of the nurse. By this is meant specifically that it is rarely required by law as a prerequisite to legal registration. There are many states that give no training whatsoever to their students in psychiatric nursing.

With the acceleration of basic programs of training in the general hospital, it is possible that those affiliations now established may be shortened or discontinued. The data reveal that of the hospitals visited in the United States only three had active post-graduate courses at this time, and these three courses had a total student enrollment of 4 students. Therefore it may be assumed that, temporarily at least, post-graduate work in psychiatric nursing has practically ceased to be. This is understandable with the opportunities for immediate service before the nurse today. However, it clearly reveals that training must be carried on in the undergraduate course if we are to have psychiatric nurses.

In 1936 the Department of Health of the Province of Ontario began to send a selected group of mental hospital staff nurses to the School of Nursing at the University of Toronto for a year of post-graduate study.

The course given is in ward administration and principles of teaching. This course is at no expense to the nurse and during her attendance at the University her salary is continued. Since the arrangement was made in 1936, there have been 28 nurses who have taken the course. Many of them are now employed as instructors in the schools of nursing in the Ontario hospitals; and this plan has done a great deal toward elevating the educational standards in the Ontario system. No such provision is made by any of the states in this country.

It is further revealed that of the hospitals visited in the United States, 21 had affiliate schools, with 536 students enrolled; and 13, three year schools with 437 students enrolled at this time; 6 three-year schools had been discontinued previous to the survey and 1 has been discontinued since it was begun.

With more than 5,000 students enrolled in schools of nursing in one state, only 3 state hospitals had basic training programs for students, and the total number of students in these courses was less than 100. In many states there are neither basic nor affiliate programs for training in psychiatric nursing. One state revealed no courses and only one graduate nurse in the entire state who had had a course in psychiatric nursing, although there is a state hospital with 1059 patients.

Administration

In the general hospital, the male patient receives nursing care identical with that of the female patient. Often this is not the case in the mental hospital. Holding tenaciously to patterns of the past, many of these hospitals have a definite line of demarcation between male and female services, so that the standard of care varies tremendously within the same institution. For instance, there are hospitals where there are no registered men nurses, and the women nurses never so much as enter the corridors of the men's division. These patients are cared for solely by the attendant group, even for medications and post-operative care.

It is rather startling that such a standard of nursing care should prevail in our mental hospitals in this modern age of medicine. Aside from the aspects of physical care, psychologically this has grave implications. Think what it means to a man who has been accustomed to women around him from his mother in infancy, probably sisters as a child, and later wife and daughters, to be thrust into such an atmosphere at this critical period of his life. Fortunately, this is not always the case. One state hospital had few graduate nurses, but there were women attendants on every men's ward except in the criminal building, and the superintendent said that this had been so beneficial to the patients that he was considering placing a selected few of the women attendants even there.

Not only is there this failure to use the women registered nurses on the men's services, but all too frequently the best prepared nurse (or nurses) have little responsibility for the nursing care of the patients. Often the highest ranking nurse may be the principal of the school of nursing, with no authority whatsoever over the attendants, who are doing the bulk of the nursing care. She may even be called the superintendent of nurses and have responsibility only for the graduate nurses. In one institution visited an attendant was observed reading a magazine while his patients were obviously being neglected. When the superintendent of nurses was questioned as to why she permitted this, she replied that she could do nothing as he was not her employee. The attendants here were under a matron attendant who was responsible directly to the superintendent. Such customs and policies as this cannot be blamed upon the present emergency, but rather part of the emergency may well be blamed upon such conditions. The superintendent of nurses in this hospital was a well prepared nurse, both in the general field and in psychiatry. It is inevitable that one of two things will occur. She will not stay in this position, or if she does, will deteriorate, since obviously she cannot lift up the situation if given no handle by which to grasp it.

Recommendations

The Nursing Committee of The American Psychiatric Association hopes therefore that

in reconstruction for the post-war period, consideration will be given:

1. To education of the public to the needs of mental patients, so that funds will be available to raise the care of all mental patients to an acceptable level. This would be the means of promoting for personnel a standard of hours, wages and living conditions comparable to those prevailing in the general hospitals.

2. The establishment of relatively uniform training for the attendants.

3. Strengthening of the basic schools of nursing in mental hospitals.

4. Increasing affiliations for student nurses.

5. Revival of and establishment of post-graduate courses for nurses.

6. Uniform standard of care for all patients within a given hospital.

7. Recognition of the status of registered nurses and the establishment of an administrative policy to use the nurses to the best advantage.

8. Centralization of all nursing personnel under competent directors of nurses.

In conclusion, it may be said that fortunately the picture is not always distressing. There are mental hospitals where all patients receive the benefit of a fine type of physical and psychological nursing care, where restraint is unknown and happiness prevails. When such conditions are observed, especially at this critical period, one is prone to believe that the superintendents of such institutions are not only physicians, but magicians.

A nursing round table on the subject of "Psychiatric Nursing in Wartime" was held at the annual meeting of The American Psychiatric Association in Detroit, Ralph M. Chambers, M. D., Vice-Chairman of the Committee on Psychiatric Nursing, presiding.

Miss Lucile Petry, Director, Division of Nurse Education, U. S. Public Health Service, gave a résumé of the Bolton Bill and discussed its application to mental nursing. Captain Kathleen Atto, representing the Army Nurse Corps, discussed psychiatric nursing in relation to the needs of the Army. Others participating were Miss May Kennedy, Chairman of the Committee on Mental Hygiene and Psychiatric Nursing of the National League of Nursing Education, and Dr. George H. Stevenson, formerly chairman of the Committee on Psychiatric Nursing of The American Psychiatric Association.

THE FREQUENCY AND SIGNIFICANCE OF A MOVEMENT MANNERISM FOR THE MILITARY PSYCHIATRIST [1]

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A survey of the experimental and theoretical literature in the field of psychopathology indicates that certain writers(6) believe persistent movement mannerisms predicate underlying undesirable "nervous" conditions. Others(11, 12, 13, 14) maintain, on the contrary, that the assumed close relationship between the so-called "nervous habits" and abnormal behavior patterns is, at best, not yet established. One of these so-called habits is that of nail-biting. This reaction, classed by some(14) with other oral responses such as thumb-sucking, has received relatively little technical attention. One of the earliest and most detailed studies was that reported by Olson(14) in 1929. In this investigation 467 elementary school children were individually and unobtrusively observed by clinicians for arbitrarily prescribed intervals of time. The results showed that oral habits in normal children were the most frequent of all [2] and that their fixity, measured in terms of frequency for each arbitrary time-unit, was unrelated to the ages of the pupils studied. The degree of nail-biting, thumb-sucking and other oral responses was found to be relatively constant for each child. Inasmuch as each subject differed in the amount of nail-biting, Olson(14, page 91) suggests that this and other similar habits cannot be considered abnormal in an all or nothing fashion. There can be little doubt as to the wisdom of this early conclusion. It is in fact supported by the observations of Viets(18) and of Koch(11). The latter, in 1935, clearly states that so-called "nervous habits" have yet to be proved indicative of psychopathological conditions and that their status as "habits" rests upon current usage and loose definition. Both Koch(11) and Louttit(13) emphasize most advisedly the fact that "tics" and "movement mannerisms" are not synonymous terms. While the former are ordinarily accepted as symptomatic of nervous states, the latter are not necessarily so. For this reason nail-biting is here considered an expressive form(2) of body movement even though it is popularly and perhaps inaccurately used as prima facie evidence of whatever its user means by "nervousness."

On the other hand, it may be none the less true that relatively persistent and severe nail-biting is occasionally indicative of psychomotor tension(10) and other abnormal conditions as has been suggested by Thom(16) and Kanner(10) in their studies with children. More recent studies on motion sickness and on the neuropsychiatric aspects of pilot selection and training in modern aviation have supported a similar interpretation. Conn, for example, reports(4) that of 25 children suffering from car sickness all were emotionally unstable. Fourteen of these boys and girls were given to frequent nail-biting. They also characteristically showed other symptoms suggestive of functional disorders. Bulla(3) and Jensen(7, 8) of the United States Army Medical Corps report additional findings pertinent to the field of aviation medicine. Jensen studied 23 pilots each of whom had experienced an accident during flight. He found psychiatric signs suggestive of deep-seated personality deviations(8). One of these signs was nail-biting.

The conclusion to be drawn from these various observations is that the present interpretation of nail-biting as a movement mannerism [3] has been formulated from two different points of view. For the first group of investigators who have for the most part employed normal subjects, these commonly encountered oral movements may or may not be closely associated with abnormal behavior patterns. The universal utilization of these movements by the unwary as indices of

[1] The opinions and assertions herewith expressed are those of the authors and are not to be construed as those of the Navy Department or of the naval service at large.

[2] This order from the most to the least frequent is: oral, nasal, hirsutal, ocular, aural and genital (14, page 36).

[3] This term is recommended by Koch(11) and is used here because it is non-committal in any interpretative sense.

abnormalities is accordingly viewed with suspicion. For the second group which has more often worked with outright personality deviations, nail-biting is assumed to be suggestive of unhealthy mental attitudes and of behavior disorders, and is consequently regarded symptomatically. In view of this divergence of opinion the purpose of the present paper is to report the frequency and significance of one selected movement mannerism exhibited upon occasion by naval recruits. Inasmuch as the military psychiatrist(15) must work with rapidity during his examination of each recruit, the data here presented may assist him in evaluating any easily identified expressive movement pattern.

The method used is observation of the extended hands of each nude recruit at the outset of a five minute neuropsychiatric and psychologic examination. The examiner, while ostensibly observing the nature and degree of digital tremors, closely inspected the nail of each finger on the two hands.[4] Next, each man was asked the following two questions, the answers to which were recorded: (1) Under what circumstances do you bite your nails the most? (2) Why do you bite them? From this point the examination proceeded according to medical and military directives. This procedure, combining the interrogation and visual observation, was continued consecutively until 2297 men had been examined. Of this number 1144 were volunteers for naval service. The remaining 1153 men were inducted through the more recently (1943) instituted Selective Service program for the United States Navy. No effort has been made to analyze the nail-biting pattern and attendant responses from a regional (urban versus rural, for example) approach. A cursory comparison on the basis of so-called race was made by recording the observations upon 150 Negro volunteer recruits.

In addition to these procedures one other datum was recorded for each examinee, namely his disposition following the examination. Each man's record thus showed whether he had passed the neurological, psychiatric and psychological tests or whether he had been "held over" for further observation. Reference will be made later to those recruits who, as nail-biters, were believed to warrant additional examination. It is emphasized at this point that no recruit was ever detained for further study solely on grounds of nail-biting.

[4] This procedure was necessary because an occasional man bites the nail of a single finger or only those fingers on one hand.

Results

The data have been arranged to show the relative frequency and significance of nail-biting in a sampling of 2297 recruits; first, the frequency for the entire group and, next, for the two sub-groups composed of (a) volunteers and (b) Selective Service recruits (Tables 1 and 2); second, the frequency of nail-biting among the samplings of Negro volunteer recruits (Table 3).

These data permit, it is believed, the following conclusions. First, it was obvious throughout each period of observation that nail-biting varied from man to man from infrequent occurrence to the dominant and relatively fixed habit observed in only a few recruits. This observation tends to support the findings reported by Olson(14). Any man who occasionally bites his nails cannot, therefore, on this basis alone be adjudged abnormal. This is clearly demonstrated by the fact that only about 27 per cent (Table 1) of the nail-biters were required to undergo more detailed neuropsychiatric and psychologic examinations. Thus, numerous recruits, addicted in degree to nail-biting, revealed no other neurological, psychiatric or psychological symptoms sufficient, in terms of present standards of military selection, to disqualify them. This statement, however, must be tempered by the following significant facts. The 27 per cent of nail-biters among the recruits held over for further study is equivalent to one nail-biter among 3.76 examinees. On the other hand, of the 2297 men examined, 533 were given to nail-biting. Thus, one man in 4.31 selectees exhibited evidence of the habit. These two ratios suggest the possibility of a slightly greater frequency of nail-biting among those detained on any ground other than that of nail mutilation. It is only safe to conclude that nail-biting cannot be used during rapid screening examinations as an easy index to underlying abnormalities.

However, the frequency of nail-biting among 2297 men, whose ages ranged between 17 and 48 years, is relatively more frequent than some might expect(19). Little difference exists between the two sub-groups. While more men of the draftee sampling were "held over" for additional observation fewer of these were given to biting their nails than were those of the enlistee category. Finally, no significant difference has been found between the white and Negro (Table 3) volunteer recruits. Both samplings revealed similar frequencies of the nail-biting mannerism.

In an effort to determine the significance of nail-biting observed in the initial examinations of recruits, the answers given to the first of the two questions above mentioned were classified as shown in Table 4, the number of men detailed for extended observation being recorded opposite each category. This relatively crude procedure was used with 508 out of 533 recruits addicted in any degree to nail-biting.

The significance of nail-biting for the student of human behavior will always remain the problem of the individual case, and is best revealed by each recruit's reaction to his own hands and to the questions of the examiner. The man who denies, often in anger, the evidence his nails betray, is quite likely to respond similarly to other situations. In several instances the social histories of these men were found to show attitudes of irresponsibility and inconsistency. Their emotional instability was apparent in their frequent attempts to escape stressful situations in civilian life. In addition, the recruit who finds it unbearable to wait briefly for appointments and who is by his own admission given to nail-biting when worried and emotionally disturbed, is likely to exhibit other symptoms that are psychiatrically disqualifying for military service. For those

TABLE 1

FREQUENCY OF NAIL-BITING AMONG 2297 NAVAL RECRUITS

	Nail-biters	"Hold over" total	Nail-biters among those "held over"
Number	533	192	51
Per cent	23.20	8.36	26.56 per cent (192 cases)
			9.75 per cent (533 cases)
			2.20 per cent (2297 cases)

TABLE 2

COMPARATIVE FREQUENCY OF NAIL-BITING AMONG 1144 NAVAL ENLISTEES AND 1153 NAVAL DRAFTEES

Nail-biters		"Hold overs"		Nail-biters among those "held over"	
Enlistees	Draftees	Enlistees	Draftees	Enlistees	Draftees
262	271	75	117	33	18

TABLE 3

COMPARATIVE FREQUENCY IN PERCENTAGES OF NAIL-BITING AMONG 1144 WHITE AND 150 NEGRO VOLUNTEER RECRUITS

Nail-biters		Percentage "held over" who were also nail-biters	
White	Negro	White	Negro
22.90	23.13	2.88	3.40

TABLE 4

CLASSIFIED RESPONSES TO THE QUESTION: WHEN DO YOU BITE YOUR NAILS MOST?

Response class	Frequency	Per cent "held over"
"At the movies"	151	5.3
"I don't" (denial)	32	21.88
"Nothing to do"	69	2.90
"Waiting around"	17	17.64
"To cut them"	96	2.08
"When I'm upset"	46	39.13
"I'm quitting"	24	0
"I don't know when"	51	2.00
Miscellaneous	22	2.09

who face the evidence and reply "It is a habit I ought to break," the likelihood of the presence of other nervous symptoms is not great. The military psychiatrist may accordingly use evidence of nail-biting as a means to an end. He may determine how the man reacts to the popularly conceived "nervous habit" of nail-biting. If he tries to escape the evidence, if he rationalizes, or if he admits general "nervousness," he provides clues to other less obvious personality traits; and if he considers correction of the habit desirable, his likelihood of showing a fairly well-adjusted personality is increased.

The nail-biting pattern in adult male subjects of military age appears, at the descriptive level at least, to illustrate Allport's(1) principle of functional autonomy of motives. In many instances men report that they acquired the habit in childhood; that older members of their families were nail-biters; that they are today unaware when they bite their nails. In fact, a few men were astonished to observe their own nails. This act, learned as it always is, comes gradually to possess its own motivating force and, hence, to run its course without undue external stimulation and without fulfilling any apparent need; the normal childhood need for the expenditure of energy, evidenced in some children by nail-biting, no longer exists. The habit in the mature adult may thus merely illustrate the "strangle hold"(17) that an early response pattern can acquire in the absence of the original stimuli. Thus, just as an animal(14, pages 62-65) can be experimentally induced to scratch excessively after the need for scratching is removed, so may nail-biting normally run its persistent course long after the inciting cause has become nonexistent. The habit is then said to be functionally autonomous(1, 5), since it has its own drive.

Nail-biting, accordingly, cannot be judged for all men at all times as evidence for the existence of a psychoneurotic or other abnormal condition. Adult addiction may merely illustrate upon occasion the fact that habits often outlast their inciting conditions. When, however, nail-biting is a sign of underlying psychopathology, as it may be upon certain occasions, it is best revealed by the man's reaction to his own behavior patterns. That this can be easily ascertained by the military psychiatrist has already been indicated.

Summary and Conclusions

The frequency and significance of a selected type of movement mannerism, nail-biting, have been studied by the interrogation and observation procedures in a sampling of 2297 white and 150 Negro recruits.

(1) Nail-biting, regardless of its frequency and severity, was present in 23.2 per cent. No difference in prevalence was found between volunteers and naval draftees. No significant difference in frequency was apparent between the white and Negro samplings.

(2) Statistical measures of central tendency are held to be inadequate means for the determination of the significance of this movement mannerism. The meaning of this and other related patterns of response must always remain the problem of the individual case.

(3) For the military psychiatrist it is maintained that the tendency to look upon nail-biting *always* as an index of psychoneurotic or other psychopathological states is not supported by the facts. The nail-biting mannerism is of value in the military screening examination only if properly interpreted.

(4) The important point is the manner in which the recruit reacts to the evidence. If he denies, evades, rationalizes, or expresses in other ways his general instability, the psychiatrist obtains important guides for further investigation. The high frequency is noted with which men, responding in these manners, were held over *on other counts* for additional neuropsychiatric study.

(5) While it is undoubtedly true that nail-biting is always significant within the personality pattern of the individual, this mannerism is far from always an index of abnormality sufficient to disqualify a recruit for basic military training.

(6) Nail-biting in adult males may, from one point of view, illustrate the "strangle hold" that childhood habits may come to possess.

(7) In the sampling of 2297 recruits roughly one man in every four was a nail-biter. Of the 192 detained for further obser-

vation roughly one man in every four exhibited this mannerism.

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FATAL CATATONIA [1]

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There is a certain psychotic syndrome which may prove fatal within a relatively short time. A patient in apparently good health may suddenly become acutely disturbed; he shows extreme motor restlessness and within a few days may die. Such conditions may also develop in the course of a psychosis of long standing. Formerly this condition was described with the collective term, "acute delirium." A more thorough examination makes it possible to separate from the acute delirium a syndrome belonging to the schizophrenic group, the so-called fatal catatonia.

In most of the symptomatic reactions, of which acute delirium is one, it is possible to demonstrate an exogenous factor which may have been recognized during the patient's lifetime or becomes demonstrable in the autopsy findings. The most common of these are infectious diseases, cerebral syphilis, general paresis, certain tumors of the brain, uremia, and especially epidemic encephalitis.

The similarity between the delirium and fatal catatonia is only a superficial one. A close observation of the motor restlessness will reveal that the pattern of the acute delirium from the very beginning is of a more primitive form, while with the onset of the catatonic excitement the movements give the impression of origin in a "higher psychic level"(2). The delusional ideas of acute delirium are more persistent and are in harmony with the emotional response. Thus it is usually much easier to establish contact on the appropriate psychotic level with this type of patient. The hallucinations and delusions are more colorful and vivid. The patient's disorientation is fully dependent on the content of his delusions and hallucinations. Confabulations are more evident and are greatly influenced by the condition as a whole. Memory for recent events is very defective. This syndrome forms a more complete and enclosed entity. The individual symptoms influence each other to a far greater extent in acute delirium than in the condition of fatal catatonia, as will be discussed later.

Scheid(24) reported 22 cases of fatal catatonia out of 1000 patients; Kleist(17) estimates that 50 per cent of his "iterativ-stereotype catatonia" end fatally. The cases that survived the acute attack showed a comparatively good prognosis as far as the outcome of their psychotic symptoms is concerned. However, Scheidegger(25) points out that they are apt to relapses of the same type. They occur mostly between the ages of 18 and 35 years, and in women 7 times as frequently as in men.

CASE HISTORIES

CASE 1.—M. E. W., 19-year-old white woman.

Family History.—Father's mother described as "highstrung, excitable, peculiar."

Father had two psychotic episodes, first at the age of 20; auditory hallucinations, ideas of reference and of persecution; impulsive behavior. Institutionalized for several months. Spontaneous recovery; however, was "unusually quiet, seclusive and very sensitive," it was difficult for him to make friends; no acute psychotic symptoms for eight years. At the age of 28 he had the second psychotic condition, very similar to the first. He committed suicide by taking bichloride of mercury tablets.

Mother's father: irritable, tense, somewhat seclusive, "a very religious man."

Mother: 45 years, living; tense, had to give up her work as a teacher because of her marked insecurity; developed temporary acromegalic changes after the birth of her first child (patient). Menstrual history: slight dysmenorrhea, otherwise negative.

Patient.—Physical history non-contributory.

Menstrual history: menarche at the age of 13; 28-day cycle, flow lasting five days; pronounced dysmenorrhea. The last menstruation was delayed for 10 days; the extreme psychotic restlessness (to be discussed later) began on the last day of her menstruation.

Prepsychotic personality: patient made satisfactory superficial adjustment, had many friends; however, she was tense, sensitive to criticism, worried a great deal about her school work and personal appearance. Four months prior to the manifestation of her first psychotic ideas, she developed difficulties in concentrating, showed emotional lability, marked insecurity. Two months later it was noted that the patient's hands were "clammy and

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white"; patient complained of tiring easily and that she was "unable to get warm."

The patient became increasingly tense, restless, overtalkative. She was preoccupied with religious matters. One day she reported that she experienced being "reborn." She felt "never before as happy"; increasing loss of interest in her environment, began neglect of her appearance. Rapid mood changes; remarking "I feel like Joan of Arc," then "I am losing my mind . . . . I feel like in a daze." Increasing perplexity and apprehension; became hallucinated; spoke of having an "unborn child."

After two weeks, sudden change in condition. Extreme restlessness, resistance to any attempt to keep her calm; she became very incoherent; disorientation alternated rapidly with periods of full orientation, mild confabulation was present. The apprehension and anxiety increased, she thought that one of her physicians wanted to kill her; tried to hide from him. A few minutes later she would feel completely secure in his presence. When she appeared frightened she would try to attack persons of her surroundings; she threatened to kill her mother. She spoke about suicide but made no attempt. Morphine and scopolamine had only brief quieting effect, barbiturates were given without any result; the sleep was very disturbed and the patient ate very little; acrocyanosis developed.

After four days this condition changed suddenly. The patient became monosyllabic, her extreme restlessness modified; she rolled around in her bed, but did not try to get up. Consciousness became increasingly clouded; fibrillary twitchings, choreiform and athetoid movements were noticeable. Pupils were dilated, reacted sluggishly to light, tendon reflexes were decreased, inconstant mild rigidity of the neck and increased cyanosis were present. The patient went into coma and could not be aroused; the temperature increased to 109°, blood pressure was 50/40; pulse 180. She was given stimulants and ice packs; her condition improved temporarily; her temperature fell to 105°, the blood pressure increased; she became responsive. The improvement lasted about four hours; then suddenly she died under the symptoms of vasomotor collapse.

Autopsy Findings.[2]—Petechial hemorrhages in the meninges, mild edema of the pia; marked hemorrhage into the hypophysis; no indication of edema of the brain; no weight increase of the brain; other organs negative (however, the bone marrow was not examined). Microscopic examination: abundant amount of erythrocytes in the pituitary gland, no other changes of tissue and cells.

Case 2.—G. C. J., 38-year-old white woman.

Family History.—Patient's mother was described as seclusive, secretive and "peculiar"; avoided any social contact with her neighbors.

The patient had her first psychotic episode at the age of 19; she became seclusive, refused to leave her room; had persecutory ideas; otherwise nothing known about her first attack. She continued to avoid people but was able to carry on with her job as musician in movie theatres. Fifteen years later the persecutory ideas intensified; she thought that people on the street were talking about her and wanted to kidnap her; she arranged certain rituals to keep the "persecutors" away. Thus she was able to make a fairly satisfactory adjustment and she lost her fears. This condition continued essentially unchanged for four years. In January 1936 she felt that she could no longer keep the "burglars" away; she became frightened and agitated, the hallucinations increased. Suddenly she became extremely restless, apprehensive and aggressive; on several occasions she attempted suicide by choking and smothering herself; once she tried to jump into the fire. Even several persons could hardly manage her. She refused to eat, her sleep was poor. This condition lasted for six days. Then it suddenly changed. She rolled around in her bed, had muscular twitchings, consciousness became increasingly clouded; acrocyanosis developed. Finally the patient went into coma; pupils were dilated and reacted sluggishly; blood pressure fell to 65/50; increasing cyanosis and petechial hemorrhages; temperature rose to 105°. Patient died of vasomotor collapse.

No autopsy was performed.

Menstrual History.—Dysmenorrhea; menstrual flow scanty, lasting from 3-4 weeks, whole cycle about 5 weeks.

Case 3.—A. L., 24-year-old white woman.

Family History.—Unknown.

Prepsychotic Personality.—Seclusive and very reserved; frequent hemicranial headaches, usually 10 days after menstruation; menarche at the age of 12 years, cycle lasted 3 weeks, menstrual flow for 6-7 days.

Two months before death personality changes became noticeable: loss of interest in work, neglected her appearance; appeared restless, spent very little time at home, saw 2-3 movies every day; sleep became poor. Three weeks later she developed ideas of reference, heard voices accusing her of "self-abuse." Suddenly she became extremely restless, impulsive and aggressive; showed suicidal tendencies. It was impossible to quiet her with either barbiturates or scopolamine. She became completely mute, but intense motor excitement continued for 8 days. Then sudden change; only primitive movements of choreiform or athetoid type were present; the patient went into coma; intense cyanosis developed, petechial hemorrhages and large hematomas appeared especially after intravenous injections (but out of proportion to any possible trauma). Blood pressure was 66/48; pulse rapid and weak; temperature rose to 105.6°; stimulants were without benefit. Respiration became irregular, of the Cheyne-Stoke type; patient finally died of respiratory failure.

Autopsy Findings.—Petechial hemorrhages, diffuse and large hematomas; stasis of liver and spleen.

Petechial hemorrhages in the meninges, edema of

[2] We want to thank Dr. Curtis Crump for the report of the autopsy.

the pia; diffuse petechias in frontal lobe, hypothalamus, and medulla oblongata; otherwise negative (bone marrow not examined).

The foregoing histories and also the cases discussed in the literature make it possible to separate a well-defined syndrome. In most instances of fatal catatonia one or more members of the family are schizophrenic. Although exact figures are lacking it seems the schizophrenic incidence is higher among the relatives, especially the siblings, of this type of patients than in the other types of schizophrenia. The previous histories of the patients show a certain vasolability and a "hemorrhagic tendency"(27). Our material is too small to allow more definite conclusions than these. But it might be of interest to investigate further the vasolability as it may prove an additional hereditary factor complicating the outcome of the psychosis. It might be that the fatalities are due to an extreme "vulnerability" and decreased "constitutional resistance to the original predispositional factor"(16). The assumption might be justified that the decreased "constitutional resistance" is identical with the factor responsible for the vasolability.

The prepsychotic personality reveals frequently a schizoid personality make-up. A great many of the patients are seclusive and withdrawn; some are able to make a satisfactory superficial adjustment as case 1. But in that case it was evident that the underlying personality was very different from the apparent impression. Also this case could be considered as basically of a schizoid type.

The physical history of these patients is essentially negative except for frequent menstrual irregularities in the women. The intervals are irregular, usually shorter, the cycles are between 15 and 21 days and the duration of flow is prolonged. In case 2 it was unusually long, mostly between 3 and 4 weeks. Of course in cases of such long menses the flow is scanty and there are 1 or 2 days intercurrent which are free of menstruation. Stauder(27) writes that in a third of his patients 3 or 4 days of menstruation were followed by 1 or 2 days interval. "These menstrual difficulties indicate a particular hemorrhagic tendency" but without adequate foundation for a "glandular dysfunction"(27).

A large number of the patients show vasolability, as migraine-like headaches. In case 1 clammy hands and slight acrocyanosis were reported. These symptoms appeared before the outbreak of her acute symptoms but after the first personality changes had already taken place. More or less pronounced acrocyanosis is well known in all types of schizophrenia, especially in catatonics.

Fatal catatonia can become manifested at different times:

1. Out of apparent health after a short prodomal phase.[3]

2. After several repeated acute and severe catatonic excitements the last one ends fatally. The patients appear more or less "normal" between the attacks.

3. The fatal catatonia represents an acute exacerbation of a subchronic or chronic form of schizophrenia. As case 2 demonstrates, this complication might be planted upon any type of schizophrenia; in case 2 the patient showed previous symptoms of the paranoid type.

A detailed history will show that the personality changes precede the acute outbreak of the psychosis from 2 weeks to a few months in the acute cases. There is no essential change of the preceding psychosis in the cases of the chronic type. In the acute conditions the patients become more seclusive, withdraw from their environment, develop difficulties in concentration, appear indifferent and neglect their appearance. Sometimes they complain of mild physical discomfort, as headaches or vague gastrointestinal upset. The patients themselves realize the change within their personality. This is usually projected in different forms into their environment. One patient describes this experience as being "reborn." The patients lose more and more contact with reality, develop delusions, ideas of reference and hallucinations, mostly of the auditory, sometimes of the visual type. As long as satisfactory rapport is possible they show typical schizophrenic thinking disorder, and appear increasingly incoherent. The perplexity becomes more evident, the patients

[3] At times the diagnosis might be somewhat difficult during those first attacks but it is facilitated in cases of previous schizophrenic episodes.

eat poorly and sleep becomes disturbed. Usually within the next 48 hours the condition suddenly changes.

The patients become extremely restless, thrashing about aimlessly, the movements are often of the "pseudoexpressive" type(17); satisfactory contact can no longer be established. The psychotic content grows less vivid and becomes poor in symptoms, only fragments of the former delusions and hallucinations can be obtained. Because of the perplexity and intense apprehension the patients are apt to attack persons of their surroundings or they may show violent suicidal attempts. They throw themselves to the floor with unbelievable force, try to jump through the window even though it is closed; one patient attempted to jump into the fire. The patients can barely be managed. Narcotics have either no effect (barbiturates) or only a very transitory effect (morphine and scopolamine). This phase resembles somewhat the epileptic twilight state except that the patients are unable to carry out the complete actions as epileptics do. There is a blind drive for annihilation. On any approach the patients try to jump up and to attack. The verbal content is very poor, at times the patients are completely mute during this phase, "mute excitement"(27).

After 2 to 8 days the psychomotor pattern changes, the movements become even more primitive, the patients roll around constantly. Myoclonic twitchings of large and small muscle groups, jactations and parakinetic movements are present. Consciousness becomes clouded, the pupils are dilated and react sluggishly to light, the tendon reflexes are decreased; cyanosis develops and is first observed at the tips of the extremities. Because of the preceding extreme restlessness and the unsatisfactory taking of fluids the patients appear dehydrated. The temperature begins to rise, the pulse is rapid. The blood pressure falls after an initial rise. At this stage the patients appear completely exhausted, consciousness becomes more clouded, finally the patients go into coma from which they cannot be aroused. Blood pressure is low (50/40), the pulse pressure is strikingly decreased, pulse is rapid and weak (180); the temperature is very high (109°). In some of the patients mild meningeal symptoms develop, as slight rigidity of the neck. Most patients show petechial hemorrhages into the skin, at times large hematomas. These cannot be attributed merely to injuries acquired during the restless period since some of the areas were protected. They also appear at a time when the phase of the extreme motor excitement has ended. The cyanosis becomes very pronounced and is no longer limited to the tips of the extremities. It seems important that some of the patients show brief improvement following this phase with even a temporary return of consciousness. In many cases death comes suddenly and is probably of cerebral origin of either the respiratory or the vasomotor type.

The autopsy findings are essentially negative. In cases 1 and 3 petechial hemorrhages in the meninges and slight edema of the pia over the parietal region were reported. There was an extensive hemorrhage into the pituitary. Otherwise the macroscopic findings were completely negative. The microscopic examination revealed only erythrocytes in the hypophysis, otherwise no changes of cells and tissue. The pathologist describes the condition as if "a capillary had burst." No etiology for it could be ascertained. This hemorrhage was considered as the ultimate cause of death. In such cases as those already mentioned where marked improvement is followed by sudden death it appears that the ultimate outcome of fatal catatonia depends on the areas in which the petechial hemorrhages occur. In those 50 per cent of the cases which recover(17) the vascular insult probably occurs in a nonvital section.

Most authors emphasize that the findings are meager and unsatisfactory except for the previously discussed hemorrhages. In some cases(4) ischemic ganglia cells and a reactive proliferation of the glia were described. Braunmuehl(4) explains the changes by vasomotor spasm and he feels they are due to a peculiar lability of the terminal cerebral arteries. Malamud, *et al.*(21), found more extensive degenerations especially in the cortex and in the basal ganglia. They also attributed these findings to "cerebral disturbances of vascular type." Jahn and Greving(13) report, in addition to a

"stasis of the inner organs," a characteristic change of the bone marrow of the femur. The fatty bone marrow is transformed to the red erythropoietic state resulting in typical changes of the blood picture. The number of the erythrocytes and reticulocytes is increased, primitive forms as normoblasts, megaloblasts and megacaryocytes appear in the blood stream. At the same time the destruction of erythrocytes is reduced as indicated by the decreased bilirubin level in the blood. There is also an increase of eosinophil leucocytes and myelocytes. These changes result in an increased viscosity of the blood and in turn contribute to the peripheral circulatory impairment thus explaining the pronounced acrocyanosis.

The frequently observed preceding menstrual disturbances are considered indicative of a "habitual" hemorrhagic tendency(27). This existing tendency becomes of significance under the strain of the peripheral circulatory impairment. The frequently described vasolability, the extreme motor restlessness, and the resulting exhaustion complicate the picture.

It is a well established observation that the sympathetic (vegetative) nervous system plays an important part in the constitutional make-up of schizophrenia. In fatal catatonia the involvement of this system seems to go to an extreme. The most severe anxiety and apprehension together with the extreme motor restlessness are in the foreground of the clinical picture. According to Josephi(15), David, and especially Kleist (17) those elementary anxiety states which are accompanied by this type of motor pattern are attributed to disturbances in the "brain stem (basal ganglia) with accompanying cortical disturbances" (frontal lobe). Scheidegger(25) writes that this affectivity (the extreme anxiety acts as a severe psychic trauma) might lead to the organic condition as "there exists a close relation between physiologic and psychologic conditions." According to Kretschmer(19) the "anatomical representations of those cortical functions which are related to the vegetative system (affectivity, state of consciousness, etc.) are in the diencephalon and in the neighboring brain stem." This elementary anxiety is primarily based upon a biological foundation correlating with the mental content and in turn influencing the vegetative-endocrine system(25).

Jahn and Greving(13) conclude that the "organic symptoms" in the beginning of schizophrenia (fatigability, headaches, sleep disturbances, respiratory arrhythmia, vertigo, vasolability, mild acrocyanosis, etc.) are to be attributed to "disturbances of the intermediate metabolism" and speak of "asthenic metabolic changes." Those metabolic changes consist of an alteration of the acid-base balance resulting in alkalosis, and an alteration of the carbohydrate and protein metabolism which is apparently influenced by an increase of "biogene amines."

Animal experiments with pigs(13) which were given 60 mg. of histamine daily showed pathological findings comparable to those seen in fatal catatonia, namely alterations of the blood and of the bone marrow with an increase of "biogene histamines" in that condition. By this, they explain the clinical symptoms of increased hematopoiesis, the decrease of blood pressure, peripheral vasomotor collapse, petechial hemorrhages, increased viscosity of the blood, etc.

The increase of the "biogene amines," products of the protein metabolism, results in an alteration of the nitrogen content(5). Heilmeyer(10) attributes those metabolic alterations to a "central nervous regulation" while Jahn and Greving(13) assume that the endocrine apparatus, especially the gonado-pituitary system plays an important rôle. Their close interrelation with the vegetative system is known. The observation of those disturbances of the "sexual-pituitary" and of the vegetative system can find practical application in the approach to the treatment of schizophrenia(1, 3).

Conclusion and Summary

Fatal catatonia is considered a complication to the usual schizophrenic course. The syndrome may occur in cases of apparent health or show itself as an exacerbation during any form of schizophrenia. The heredobiologic and pathophysiologic mechanisms, and the clinical course prove that this syndrome does not represent a separate schizophrenic group but merely a complication.

The symptoms are: A prodromal phase which lasts from 2 weeks to a few months and shows the usual schizophrenic pattern.

First Phase.—Increasing perplexity and intense anxiety; incoherence; extreme restlessness; a "blind drive for annihilation" and suicidal tendencies; acrocyanosis, increased blood-pressure.

Second Phase.—Motor restlessness changing to a more primitive pattern; consciousness becomes increasingly clouded; unusual hematopoietic changes of the blood; blood pressure falls; pulse is rapid and weak; pupils are dilated and react sluggishly to light; reflexes are decreased; high elevation of temperature; pronounced cyanosis; petechial hemorrhages into the tissue; sudden respiratory death or vasomotor collapse.

Autopsy Findings.—Negative except for petechial hemorrhages into the tissues, and transformation of the fatty bone marrow to the erythropoietic state.

A theory of possible "asthenic metabolic changes" due to disturbances in the hormonal-vegetative system, and its practical application were discussed.

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WAYS OF THINKING IN BRAIN-CRIPPLED DEFICIENT CHILDREN[1]

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The description and analysis of thinking disturbances in children is rather difficult because of the lack of a generally accepted terminology, our incomplete knowledge concerning the development of the higher mental processes in childhood, and the "uncertain status of investigating children's mental thology of brain-injured adults.[11]

In the psychiatry of the adult, Goldstein and Scheerer,[3] Hanfmann and Kasanin,[4] Halstead[5]—to mention a few—have attempted to use different tests in brain-injured and psychotic patients. I have emphasized for many years the peculiar mental organization of the brain-injured deficient child,[6, 7] and, with others, have succeeded in developing tests to analyze some of the behavior disturbances in the perceptual and conceptual fields.[8-10]

In forming conceptual relationships, brain-injured children tend to relate ideas or objects on the basis of unusual or non-essential details more often than do non-brain-injured children. They also tend to connect ideas on the basis of quite remote, far-fetched relationships. This disturbance seems to be closely related to certain phenomena of intellectual disorganization in the psychopathology of brain-injured adults.[11]

One of our tests analyzing conceptual thinking[12] involves the relationship between life situations represented in pictures and small, three dimensional toy objects. One picture represents a boy who is about to drown, the other a building on fire. The pictures are placed perpendicularly side by side before the child. There are 86 small objects: human and animal figures, cars, trees, tools, etc. The child is required to select and place those objects which he thinks go best with each picture, in front of either of the two pictures, and to discard the others. In this test, the performance of brain-injured mentally defective children was compared with the performance of non-brain-injured normal and mentally defective children. As a sample of far-fetched grouping by brain-crippled children, we have the placing of a table, chair, fork and spoon before the picture of the drowning scene. A typical explanation for such a performance was, "After the boy has been saved he has got to eat." The following is an example of how the brain-crippled child may lose sight of the main idea by becoming involved in some particular detail of the situation, *i.e.*, instead of placing all objects with reference to the picture of the drowning scene, the subject suddenly conceived of the region in front of the picture as a "garden"; he put in garden tools, trees, benches and a human figure as a gardener. The arrangements of objects by brain-crippled children contained many of those relatively independent units which were practically absent in placements by non-brain-injured children.

The unusual arrangement of furniture before the picture of the drowning boy illustrates the tendency of the brain-crippled child to extend a given situation inordinately in space and time. While the non-brain-injured children restricted themselves realistically to the immediate situation, brain-crippled children tended to remove the boundaries of the present event, expanding it into the past and the future. Thus, for example, several children enlarged the drowning situation to the point where the boy was brought to the hospital.

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One boy then placed Santa Claus and other objects before the picture "because he brings the toys there to the boy when he is in the hospital." The boat was related to the drowning picture because "when the boat was coming he did not know to get out of the way and was drowning."

The results of this test are used to demonstrate some of the peculiarities in the thinking process of brain-crippled deficient children; the psychological analysis will be discussed again in the final comment.

The main purpose of this paper is to present three clinical observations which may throw some light on the problem of how these thinking disturbances may influence the brain-crippled child's behavior in everyday life.

Excluding the thinking disturbances in the major psychoses of childhood, there is one brain disease which changes the child's personality very profoundly, epidemic encephalitis. Besides neurological disturbances and changes in character, an outstanding feature found in some of these children is excessive phantasy production and lying.

The following case is reported here as an illustration of this type of personality disorder because of some similarities in the general symptomatology which will be discussed at a later point.

CASE I.—J. W., age 13, admitted in 1941 and in residence 1½ years. White boy of American parentage. Father, eighth grade education, skilled laborer. Mother, eighth grade education, good housekeeper. Two siblings, well adjusted to school and home.

Birth normal, walked at 9 months, talked at 11 months. Usual children's diseases, all very light.

Encephalitis at 5, with right strabismus and temporary glycosuria following. During the last year (1940) inversion of sleep. Reported could not sleep till 2 a. m. and experienced great difficulty in keeping awake during the day. Entered school at 6, attendance very irregular; did not learn to read. Referred to special class at 11. Teacher reported, "truants, smokes in and out of school, swears at teacher and children, always fighting, has temper tantrums, does no school work, steals from children, ... one day exposed himself at school."

Medical and neurological examinations on admission negative save for amblyopia exanopsia and severe astigmatism. Psychometric data, mental age 10 years, 2 months, I. Q. 70; educational age 7 years, 1 month, E. Q. 54; Grace Arthur performance age 10 years, 11 months, P. Q. 85.

Adjusted to the Training School slowly. Could not grasp the idea that he had to care for himself with respect to personal habits; had difficulty in adjusting to the group because he kept away from it and did as he pleased. After a few weeks accepted by the group and happy in the regular life, duties and responsibilties. Two abnormal traits remained: first, he stole little things in the school and in the cottage and gave them away indiscriminately; second, he lied, or better, he phantasied monstrously about events which had not happened. A cottage report reads, ". . . . he is not exactly a day-dreamer but he can think of some of the most fanciful yarns and when he tells them I think he believes them. The other day two boys were supposed to have truanted from school. When he learned of this he said that he had seen the boys going into a tunnel at the main kitchen. First, he had never been near the kitchen at the time stated because he was then in the cottage. Second, there is no tunnel entrance anywhere near the main kitchen. Third, the boys involved returned to the cottage, they were gone on an errand. . . . ." Two weeks later he upset the whole cottage by accusing a night attendant of having abused the boys sexually. According to his story, the attendant took several boys out of bed, let them kneel before him to punish them on their bare buttocks with a leather strap. Since this was said to have occurred in a sleeping room of forty boys "and none of the other boys had observed it," it could be proved to be a phantasy story.

The phantasy production and lying follow well the behavior patterns which are known to be sequelæ of epidemic encephalitis.

With this fairly familiar story as an introduction, we proceed to the primary purpose of this paper, the demonstration of the peculiarities of thinking in brain-crippled deficient children.

The following three cases are children who suffered a brain-trauma at birth.

CASE II.—D. I., age 12, a boy, admitted in 1936; in residence 5 years. Father, naturalized English Jew; mother, American Jewess. Both parents intelligent; father, small independent business man; home above average standard. One brother, eight years younger, normal. Home environment overprotective.

Birth at full term by presumably normal labor. Molding of the head in the birth process obviously excessive as the head was described as misshapen and pointed in front. Usual children's diseases, all very light. After scarlet fever when 6 years old, alopecia universalis.

Always a peculiar child. Entered school at 6 but did not perform beyond reciting stories and poems. Examined at 7 years of age by psychologists: answered the questions by repeating questions given earlier in the examination. I. Q. 57. Examined again at 12; described as "very flighty, ... never smiles, has a blank gaze at times and constantly asks questions, unusual ones at times, repeating them after they have been carefully answered." I. Q. 57.

The following is the report of the first interview after admission. "He talks continuously, asking

question after question. He wanted to see the superintendent, saying, 'If I want something I always like to see the head man. I wish I had forty dollars. I'd give it to Dr. H. Would he let me out then? . . . . Why is it I can't cry? I never cry when I'm hurt. Why is it when the kids hit me I just stand like a statue and don't cry? A woman asked my mother if I was crazy because I never cry. Do you believe in Christ? Why did they kill Christ? I'm a Jew. I don't believe in anybody but God. Could I play Christ in the Christmas play? I couldn't be God could I? He makes babies. I'm afraid of God. Will he punish me if I draw his picture? How does God let babies down from heaven? Does he let them down in a basket? Is it pregnant when a woman is all swelled out with a baby? A woman undressed in front of me and showed me her sights. Why did she do that? Was she crazy? Why do people vomit? I vomited a lot. Can cats vomit? Can you vomit? Why do cats vomit? Does milk make anybody sick? Why isn't coffee good for you? . . . .'"

The interviewer, a mental hygienist, comments, "This boy's focus of neurotic tension seems to center around the mouth and eyes. He is preoccupied with vomiting. He habitually spits on his food. He draws a picture of 'God making a baby' in which the instrument of creation is directed toward the boy's mouth. The boy has his eyes closed 'because he isn't born yet.' Drawings of his father and mother show concentration of detail around the eyes, nose and mouth. He draws a picture of his father feeding with a bottle, and shows one of the father's arms originating from the mouth, then says 'No, the arms should be down here on the side.' This boy is suffering from a very active conflict involving a morbid parent-child relationship, preoccupation with the problem of birth, oral-erotic tension, inferiority feelings regarding his personal appearance. It is my impression that this boy's continual questioning represents an effort of gaining security. He openly expresses a desire to be God, which may be interpreted as an attempt to gain security and power through knowing everything. In spite of his serious maladjustment, his prognosis seems good. He understands readily and seems capable of gaining insight. An active program of clinical interviewing and habit training is indicated."

Three weeks later the same interviewer reports, ". . . . his progress has been checked frequently. He is now eating almost normally, using knife, fork, and spoon although clumsily. He no longer spits out his food. He announces proudly today that he now dresses himself and has a dusting job in the cottage . . . . seems happier today, and is much less tense and anxious than he was when admitted. . . . ."

One week later the report reads, ". . . . he was 'put on' the stage of the auditorium at a recent amateur program. The cottage mother was doubtful of his ability, but when his turn came, he walked boldly out on the stage grinning widely. He was greeted with much laughter. However, he kept smiling and finally obtained silence. He went through his act of pantomiming certain radio stars including Ben Bernie. The audience was completely won over by him and applauded enthusiastically. As a final gesture, he made a low sweeping bow and then raised upward. As he did this he put his hand up to his completely bald head as though sweeping back locks of hairs. This amused the audience immensely. This boy's popularity is now assured and his path will be much easier. . . . ."

The following reports are given by the school department during four years of training.

Academic room, ". . . . evidently capable enough but has not formed the habit of doing his work without constant supervision . . . . the boys of the group are very nice to him. He has really tried to do as the others do several times . . . . needs frequent personal contacts to keep him from daydreaming . . . . does a far better grade of work than one might expect. . . . ."

Handwork room, ". . . . appears to be contented, accomplishes nothing . . . . did not seem able to handle the tools properly. . . . ."

Final school report, "The reactions of this boy are so definitely individualistic that you can expect anything from him. He may work one day and be exceedingly capable, or half a day—the next half day he may seem to know absolutely nothing. He can plan a unit of work; he can use a dictionary; he can solve a problem but from day to day one never knows whether this will be the day when he can think or the day when he can only talk and question."

At the beginning of his training, reading grade 3.0, arithmetic grade 3.1. At the end of the schooling period, reading grade 4.8, arithmetic grade 3.3, manual performance age always below 6 years. I. Q. remained constant, being 57 on admission and 55 when released.

One psychometrist remarks after a test given when this boy had been 2½ years in residence, "Judging from his remarks it would appear that he has more mental ability than is actually brought out during the test situation. Any flow of thought is continually interrupted by a flight of ideas. In the middle of test questions he would suddenly interrupt with such remarks as, 'Does God like to see lions eat people? My family has hardly died yet? Has Jesus died yet? Do you think that Lincoln could do that when he was this young?' It will be seen that his range of ideas is quite widespread with remarks like these continually throughout the examination. It would seem therefore that he is actually handicapped by this, as at no time does he apparently integrate his mental capacity toward a definite goal or continue with one constructive line of thought without interruption. He is a loquacious child, full of observations concerning his environment and he has an unusually good speaking vocabulary. He referred to his 'mentality' and wondered how well it rated. He does try to cooperate and is extremely responsive to praise."

On special qualitative performance tests, developed here for brain-crippled children, the exami-

nation revealed a severe handicap of form perception, form retention and form abstraction, and a severe defect in visuo-motor organization. This result explains his arithmetic retardation, his low manual performance age, his inability in handwork and justifies the vocational supervisor's report on release from the Training School, "He proved to be totally incapable of even the simplest tasks, after several years of vocational placements on simple jobs."

The neurological examination revealed hyperextensibility of joints, Babinski-sign on both sides, mask-like facial expression and a lack of spontaneity. Tentative diagnosis, brain lesion, probably acquired at birth, possibly in the frontal lobes.

In summary, we have a boy, probably birth injured, showing signs of brain lesion, and spoiled by his parents. Institutional adjustment was difficult but soon proper habits were established. Mental abilities were on the moron level. The I. Q. remained constant with educational progress in reading but severe handicap in arithmetic and poor performance on visuo-motor tests. Vocational progress was nil. In general response the following features were outstanding, keen interest in all happenings of every-day life, good memory, flight of ideas and loquacity. Emotional expressions were stable but shallow, there was lack of spontaneity and initiative.

To give insight into the ways of thinking of this brain-crippled deficient child the following incident is presented, occurring at the age of 17.

The poultry man wrote, "This boy was found in the furnace room of the poultry plant today. Questioned as to how he came to be there, he asked in turn, 'If a person or animal were burned—would they haunt you?' A little later in the day, a kitten in the poultry house was found badly burned. I remembered then that D. I.'s shirt and arms were all black when I saw him earlier in the furnace room so I knew that he had put the kitten on the fire, and I decided to remove him from his job."

The following is a résumé of an interview with the boy the next day. He was greatly preoccupied with the problem of life and death. He was especially impressed by a radio program presenting the story of a pathological individual who kills other people whose spirits returned to haunt the murderer. The problem of this radio program was reported by the boy with the question, "I want to know if haunting is true or false?" Another problem which disturbed the boy arose from stories of the Bible and from fairy tales. Thus, "A staff can be turned into a snake; animals change their forms into human beings and human beings can become animals; are those persons with superhuman power still living among us?" These ideas occupy the boy's thinking continuously and must be borne in mind to understand the mentioned kitten incident. He stated that he had a job in the poultry house. Among his chores, several times, had fallen the job of putting dead chickens into the furnace. The day he had been reported for cruelty, he saw a kitten which to him appeared very sick. On his own initiative he put this kitten in the furnace, then became frightened by the superstitions and fears mentioned above, and proceeded to pull the kitten out.

CASE III.—L. R., age 12, a boy, admitted in 1939 and in residence 3 years. Only child of American parents. Father, college education. Mother, ninth grade education. Home environment above average. Shortly before admission seen by the neurology department of the University Hospital whose report reads in summary, ". . . . prematurely born, instrumental baby. Marking of forceps over the entire left side of head, face and shoulders. Slow development. Walking started at the age of four. Some difficulty in hearing. Eleven years old, three spells of dizziness, headache, turned white, became unconscious. Neurological examination: VII and XII nerves affected on the right side, reflex differences pointing to the right side. Choreiform movements. Diagnosis: old birth-injury. Report of the otology department: nerve deafness, hearing defect partially due to enlarged adenoids."

Adjustment to the Training School difficult in the beginning. Tried to impose his will and wishes on others; could not mix with other boys. Worked only when closely supervised. Academically slow in reading and spelling. On admission: mental age 8 years, 8 months; I. Q. 67; at the time of discharge, mental age 9 years, 10 months, I. Q. 72.

A few months after admission, the cottage supervisor reported improvement in the boy's personal habits and group behavior. However, he began to tell stories about mistreatment by employees and belongings taken away by other boys. Confronted with his accusations, he cannot explain his tales. Of one of these interviews—the boy had been in the institution one and one half years—the mental hygienist reported, ". . . . a very difficult subject to interview. His answers are extremely short and unelaborated. He tends very markedly to steer off from the subject at hand, following some minor detail which sets up a new train of associations. This is particularly true in discussing any difficulties which he may have had. Here it is almost impossible to pin him down to the direct question as he picks up some inconsequential item and by means of this leaves the field. For this reason he might appear evasive and sometimes untruthful. His untruthfulness would appear to be not so much defensive lying as a loss of the focus of discussion. He also appears to confuse his own wishful thinking with reality . . . . appears to be extremely unstable and to show marked evidence of having been pampered in the home situation. He refuses to accept any responsibility for his own behavior and

even when forced to do so, one feels that his admission of being in the wrong is only academic and extremely superficial."

During the last year, the boy was enrolled in a special class for brain-crippled children. After 6 months of training he increased his educational age 4 months, his reading age 14 months. This progress continued after having been transferred to the general school. His teacher reported, ". . . . does creditable fifth grade arithmetic but is limited to third grade spelling; reading fourth grade and better in comprehension."

The cottage father reported recently, ". . . . is getting along very well . . . . he is easily dealt with and is generally most anxious to please others." However, in spite of the improvement, the chief characteristics mentioned in the report of the mental hygienist persisted in lessened degree.

Summarizing, we have a boy, brain-injured at birth, mentally within borderline limits. Eventually adjusted well to the Training School, educational progress good, I. Q. remained constant. Outstanding features were incoherence and lack of ability to discriminate essential from unessential impressions; also appeared to be evasive and untruthful.

The peculiarities of this boy's mental make-up become apparent in the results of two tests which reveal the striking discrepancy between situations where questions can be answered correctly only by knowledge of facts, and situations where free associations are required.

In the first test, questions were asked which put the child in intellectual distress. (Question: Why is it dark at night?) "Because one side of the world is dark and the other light . . . ." (How does it get dark?) ". . . . the earth moves around and it begins to get dark." (What makes an echo?) "When you holler your voice goes against something and comes back." (Why is the sky blue?) "Because there is nothing there. You just see through and it is true blue." (Why is it healthier to smoke a pipe than a cigar?) "Because the smoke of a pipe will not burn your mouth but a cigar might if it gets close." (Why can you see yourself in a mirror?) "Because it got some kind of paint on the other side of the glass."

Considering this boy's mental age of 9 years, 10 months, I. Q. 72, one has to admit that his answers were very satisfactory.

The second test is one of our concept-formation tests.

In this test the child has to present a story by pictures. The story has three parts. The topics of the three parts are, (1) "What happens when children get up in the morning?" (2) "What happens on the street when children are on their way to school?" (3) "What happens when children are in the schoolroom?" There are three vertically standing frames corresponding to the three parts of the story. For story 1, the child has in front of him a group of pictures cut out from magazines. From these pictures he has to select those which fit into the story and to discard those which are unrelated to the story. These selections must be placed in an upright position behind frame No. 1. After having completed this task, the child has to proceed in the same way with the second and third stories.

In this test, our boy selected the following pictures for the first stage, "What happens when children get up in the morning?" Correct responses: picture of a boy getting up, of a boy in a bath-robe, of soap, toothbrush, of oranges, of ham and eggs, etc., Incorrect responses: a picture of a mother with children reading, (he explains this inclusion with "because mother tells a story in the evening"), boy with a mail box ("because during the day he looks for mail"), several tools like hammer, saw, clamp ("because you need it in the workshop"), overshoes ("for muddy days"), a hat ("because one wears it on Sundays"), boys in swimming suits ("because they have fun"). For the second stage, "What happens on the street when children are on their way to school?", he selected the following pictures, Correct responses: school boy and girl, boy with school bag, street-car, station-wagon, cars, children, policeman, etc., Incorrect responses: a river scene ("because boy passes a river"), bridge ("because a car passes a bridge"), children with a little wagon ("because they carry groceries after school"), lumber ("because they cut it and use the stuff in school"), etc.

CASE IV.—G. P., age 12 years, 8 months, a boy, admitted in 1939 and in residence 3 years. Only child of American parents of average intelligence and average social environment. Premature birth at 7 months. Instrumental delivery with markings of instruments over the head. Convulsions at 3 months. Slow motor development. When 2 years old a fall on the head, stunned for ten minutes. Always an emotionally maladjusted child; home atmosphere between the parents unhappy. Psychologists mention prior to admission: instability, distractibility, restlessness, poor auditory attention. Known to be always in fights with other children, pinching, twisting their arms, etc.

Physical examination on admission disclosed auditory and slight visual defects. Psychometric data: mental age 7 years, 8 months, I. Q. 88; educational age 7 years, 10 months, E. Q. 81; Grace Arthur performance age 7 years, 1 month, P. Q. 81.

Made excellent progress educationally and socially during residence. Cottage reports stated, ". . . . is truthful and dependable . . . . very capable, has pleasant manners and demands little attention . . . . enjoys pleasing persons in authority . . . . takes care of his own belongings and respects the belongings of others, ... has a great sense of humor . . . . always willing to help . . . . appears happy at all times and takes an active part in most forms of recreation . . . . has no trouble with

any employees . . . . never has a fight or quarrels . . . . gets along very well with other children and has many friends. . . . ." These excerpts cover a period of the last two years.

The school department reported, ". . . . is happy, cooperates well with the group and makes no trouble . . . . is cooperative . . . . a nice little pupil. . . . ."

The psychometrist reported, ". . . . judging not only from the test results but also from his manner during the examination, he is more apt in abstract than in concrete situations . . . . his manner was alert, eager and apparently stimulated to do the best possible." Two years later, the same examiner reported ". . . . despite a long testing period, his attention and effort were excellent throughout. He was very interested in the work and showed good autocriticism and perseverance. He was friendly and very spontaneous. . . . ."

In contradistinction to these results obtained by routine, so to speak, rigid testing, in qualitative tests described earlier, specifically devised to elicit conceptual disturbances in brain-crippled deficient children, this boy appeared conspicuous in two seemingly opposite behavior traits. While he dramatized in a fanciful way the sober logical tasks requested of him, yet at the same time he was extremely pedantic and meticulous in many ways.

Admitted to a special class for training brain-crippled children (1941). After half a year in this special class we reported. ". . . . reads constantly and excessively any unselected material . . . . spelling is poor . . . . handwriting careless . . . . effort for acquiring academic knowledge is very slight." After another half year, we reported. ". . . . has improved; though in spelling, arithmetic and reading he has only slightly increased his knowledge, his attitude toward work has changed considerably. It is now possible to interest him in academic work and he has started with the composition of short stories. There his specific thinking disturbance becomes more apparent. . . . ." (At this time the psychometric data were: mental age 10 years, I. Q. 90; reading grade 4.5; arithmetic grade 4.6; spelling grade 3.5.) "It was difficult to induce him to write a summary of any story he had just finished, *e.g.*, he always referred to the book for words he wanted to use. A change in method was adopted. The particular story we are concerned with here was about building a house. The story once finished, the book was taken away and he was asked to draw on a cardboard (24″ x 36″) the floor plan of a house with its various rooms. He next was to write on little paper slips the words describing the different pieces of furniture, stoves, lighting equipment, etc., and to fit them in the house plan. When this was completed he was asked to write a story about the house without any use of the book. The following are his three attempts to write this story:

(First attempt) "'Open the doors . . . . sweep the steps . . . . move the chairs . . . . dust the telephone . . . . turn the lamp . . . . sit by the fireplace . . . . we eat at the table . . . . look out the window . . . . go in the kitchen . . . . look at the stove . . . . look at the sink . . . . clean the bathtub . . . . sleep in bed . . . . turn on the heat-register . . . . clean the sewer.' He was then told that this was not a good story.

(Second attempt) "'I sweep the floor . . . . I open the door . . . . I sat on the porch . . . . I talk through the telephone . . . . I sat in the chair . . . . I stand near the fireplace . . . . I turn on the light . . . . I look out of the window . . . . I look at the sink . . . . I sat at the table . . . . I went to the kitchen . . . . I touch the stove . . . . I look at the sink.' He was told again that this was not a good story.

(Third attempt) "'One night a tramp came up, so I kick him down the steps . . . . the tramp tuck a fit and ran up the porch . . . . he ran to a chair . . . . and ran to rest . . . . I kick him out of the chair right into the fireplace . . . . he ran to the kitchen and got into the sink . . . . he ran to the stove and burned his nose.'

"When I asked him, 'Why did the tramp get into the sink?', he answered, 'Why not? Then I can put water over him.'"

In summary, we have a boy, brain-injured at birth, maladjusted before admission. In the Training School a "model" child, progressing educationally, I. Q. remaining constant. Specific tests and close analysis of his academic work revealed signs of a thinking disturbance characterized by pedantry and evasion into grotesque phantasies.

The discrepancy between this meticulosity in relating factual events and the wild and incoherent imagination products in a boy with a mental age of 10 years and an I. Q. of 90, helps us understand the following contrast of behavior.

Some months ago the boy was returned to his home and now attends a public school. Yet, two weeks after his return home the administration of the Training School received a letter from his mother complaining about instances of mistreatment he had described as having occurred during his residence. He had spoken, in particular, about an older woman attendant in his cottage (whom all the children call "grandma") as an old witch who punished the children corporally. All the accusations were contrary to the most friendly attitude known to exist from both sides during the child's residence and re-enacted during a whole day's visit back to the Training School after a short interval home.

Without previous knowledge of this boy's pecularities of mental functioning, it would hardly have been possible to reconcile his obvious misrepresentations of past happenings with his reliability, well known to everybody in the Training School and emphasized by his mother.

Discussion

The case histories of three brain-crippled deficient children have been presented. They all evidenced in varying degree a thinking disturbance characterized by lack of ability to discriminate between essential and non-essential details, evasion from reality, escaping in grotesque phantasies, incoherence and flight of ideas.

These cases were selected from a group of brain-crippled deficient children who presented the signs of a thinking disorder as a more or less specific syndrome. It must be emphasized that the histories presented are not unique.

The first question which may be asked is whether this disturbance is characteristic of mental deficiency as such. From investigations, published elsewhere,[13] it may be said that this type of disturbance in the thought process, demonstrable by specially devised tests, is rarely found in non-brain-injured normal or in feebleminded children. Furthermore, the degree of this thinking disturbance shows no correlation whatsoever with the intelligence quotient. One may find a more severe handicap in thinking in a child of the borderline level than in a child of the moron and imbecile level. It is not the degree of the thinking disorder itself, rather it is the combination with other disturbances in the perceptual and motor fields which determines the range of a brain-crippled child's mental activity.

The second question is, where shall this disorder of thinking be placed within the group of thinking disturbances already known? Kanner [14] has attempted to classify the thinking difficulties in childhood according to four different functions in the learning process (the term learning used in the widest sense). He speaks of: (a) awareness of a purpose, the realization of a goal; (b) vigilance, the ability to react to stimuli of sufficient intensity; (c) selectivity, the capacity to discriminate between relevant and irrelevant perceptions; (d) tenacity, or concentration, the ability to pursue the goal until achieved.

[13] Cf. Strauss, A. A., and Werner, H. J. Nerv. Ment. Diseas., 96: 153, August 1942.

[14] Kanner, L. Child psychiatry. Baltimore, Charles Thomas, 1937, p. 296 ff.

An attempt to analyze the thinking disturbances of the brain-crippled deficient child with reference to Kanner's four categories follows:

(a) It is probably not difficult for the brain-crippled child to be aware of the task and to realize the goal demanded of him. Moreover, he will stick to the task much more than non-brain-injured children and even ask meticulously what he is supposed to do.

(b) Very often, it can be observed that the brain-crippled child is not affected in his vigilance; quite often he is hypervigilant, as has been described by Homburger.[15] As a result of his hypervigilance the child sometimes seems to be attracted by stimuli insufficient in intensity or extent for the normal.

(c) The most serious handicap lies in the function of selectivity. The lack of ability to discriminate essential from non-essential details in impressions, the abnormal fixation and perseveration to those details, the clustering of details into unessential thought complexes are factors impeding the normal flow of thoughts. These factors have been unraveled in analyzing the disturbances of thought processes by the previously described tests.[16]

(d) The tenacity, the ability to pursue a goal, is impaired to a certain degree by the hypervigilance and inability to discriminate. Moreover, the disinhibition and incoherence in performance will interfere with a sober, steady and equalized sequence of actions necessary to bring a task begun to the expected goal. This disinhibition has been found to be a characteristic behavior trait by many workers dealing with brain-crippled children.[17] It has been demonstrated that incoherence in performance is one of the typical disturbances of the brain-crippled child in tasks pertaining to the perceptual as well as to the conceptual field.[18-20]

[15] Homburger, A. Vorlesungen ueber Psychopathologie des Kindesalters, Berlin, Julius Springer, 1926, p. 456.

[16] Cf. Strauss, A. A., and Werner, H. J. Nerv. Ment. Diseas., 96: 153, August 1942.

[17] Strauss, A. A., and Kephart, N. C. Behavior differences in mentally retarded children. Am. J. Psychiat., 96: 1117, March 1940.

[18] Cf. Strauss, A. A., and Werner, H. Am. J. Psychiat., 97: 1194, March 1941.

Following Kanner's interpretation, it may be concluded that the thinking disturbance of brain-crippled children shows its effect on the learning process in the functions of vigilance, selectivity and tenacity. The realization of the goal is undisturbed. This fact supplies one more argument against the assumption that the disturbance of brain-crippled deficient children may be due to their mental deficiency. As Kanner points out, the mental inefficiency of feebleminded children includes the difficulty of the realization of a goal. This difficulty is responsible for the lack of comprehension typical of feebleminded children. In analyzing the thinking disorders of brain-crippled children, one is faced with the paradoxical observation that they recognize reality well and stick very closely, even meticulously to the facts, but at the same time, by their manifold kinds of specific disorders, may evade the sober solution of the task or even escape in a phantasy world of sometimes monstrous dimensions. It is to the solution of this problem that future research will be directed.

The third question is, should one classify the thinking disorder, severe as in Case II, as psychotic, or should one diagnose the thought disturbance in Cases III and IV as pertaining to behavior disorders of children with organic brain diseases or with neurosis, or should we assume that thinking difficulties of brain-crippled deficient children represent a disorder sui generis?

It may seem too early to venture a final opinion on this problem, nevertheless certain impressions are gained. In a psychosis, usually a deterioration occurs.[21] All three children here presented remained constant in I. Q. and developed academically according to expectation.

To avoid a too extensive discussion, for the classification of Cases III and IV, two signs of the thinking disorder, phantasying and lying have been selected. In organic brain diseases, such as in postencephalitis (Case I), the phantasy production and misrepresentation of facts are part of the general picture of the personality changes. It is known that post-encephalitic children quite often change to amoral and asocial personalities; they lie and phantasy, so to speak, "out of the blue sky." These "moral" defects are mostly associated with others, like stealing, sex deviations, and so on. In contrast to this picture, the brain-crippled child presents a rather astonishing phenomenon. He may report facts very accurately but, if allowed "to get loose," he reports the same facts with a convincing truthfulness in a most aberrant and phantastic fashion. Moreover, he rarely shows any personality deviations of the kind found in post-encephalitic children.

Taking into account this observation, the difference between neurotic and organic behavior may be discussed. In a recent article on compulsive phenomena in organic and functional disorders Goldstein [22] starts with the assumption that both a neurotic and an organic patient experience "compulsive tendencies" as a disorder. "However, the behavior of the neurotic patient is influenced to a much greater degree by his experiences. His entire personality is controlled by them, changed, as compared with what it was earlier. . . . . The picture is entirely different in the patient with compulsive phenomena of an organic origin. He conceives the compulsion as something entirely strange, peripheral; something which has nothing to do with his personality. . . . . The organic disorder can only result in a change of personality if it occurs in an individual whose personality is constitutionally abnormal and weak. . . . ."

If one bears in mind certain fundamental differences between children and adults, especially in the lack of experience previous to the occurrence of the defect and in the lack of insight existing in a not fully developed mental organism, the adult behavior described by Goldstein fits well the behavior observed in neurotic and brain-crippled children. Whereas, in the neurotic child, phenomena like lying and excessive phantasy are a part of deviations embracing the entire

[19] Cf. Werner, H., and Strauss, A. A. J. Abn. Soc. Psychol., **36**: 236, April 1941.

[20] L. c. No. 16.

[21] Greene, R. A. Conflicts in diagnosis between mental deficiency and certain psychoses. Proceed. Am. Ass. Ment. Def., **38**: 127, 1933.

[22] Goldstein, K. Analogous mechanisms in the formation of symptoms in organic and functional disorders. Bull. Forest Sanatorium, Des Plaines, Illinois, 1: 28, April 1942.

personality, in brain-crippled deficient children these phenomena are often irreconcilable with the child's personality (Case IV). They can be interpreted as a result of the thinking disorder and as a more peripheral defect detectable only by specific analysis.

The cases reported have left the Training School and, at a later date, comprehensive follow-up findings relative to community and family adjustment will be reported; also, further results in the special training and treatment of thinking disturbances in brain-crippled deficient children.

THE OXYGEN CONTENT OF CEREBRAL BLOOD IN PATIENTS WITH ACUTE SYMPTOMATIC PSYCHOSES AND ACUTE DESTRUCTIVE BRAIN LESIONS[1]

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Though it is known that symptomatic psychoses may be associated with pernicious anemia and cardiac decompensation, there are no studies of brain metabolism in these conditions. In the present investigation we examined the cerebral metabolism of patients with pernicious anemia and cardiac decompensation who developed mental symptoms in the course of their illness. The results so obtained were contrasted with others on patients with acute destructive brain lesions. Samples of arterial blood were collected from the femoral or brachial arteries. The cerebral venous blood was drawn by the method of Myerson, Halloran and Hirsch(1) from the internal jugular vein. Blood samples were analyzed for oxygen by the method of Van Slyke and Neill(2).

RESULTS

Three patients were studied with diagnoses of pernicious anemia, cardiac decompensation, and acute luetic encephalitis respectively. The first two observations on the patient with pernicious anemia were made before liver therapy was instituted. The patient was disorientated, confused and incoherent. His average cerebral arterio-venous oxygen difference was greatly decreased to 2.54 volumes per cent and his average venous oxygen content was reduced to 2.01 volumes per cent. Other laboratory findings made before therapy are as follows: WBC, 7,200; HB, 3.2 gms.; RBC, 995,000; CI, 1.05; NPN, 36 mgm. per cent; A/G, 2.2; serum protein, 6.5; gastric test, free acid, 0, total acid, 8. It is probable that the mental symptoms were caused by the inadequate oxygen supplies of the brain. Evidence in favor of this conclusion was afforded by the third observation which was made after the patient had reacted successfully to therapy because an increase of oxygen content of the arterial blood from 4.55 volumes per cent to 13.85 volumes per cent was followed by an alleviation of the mental symptoms. Cerebral arterio-venous oxygen difference rose to 7.36 volumes per cent, venous oxygen contents to 6.49 volumes per cent, hemoglobin to 13.2 gms. and RBC to 4,700,000.

TABLE I

HEMATOLOGIC DATA ON TWO PATIENTS WITH EXOGENIC PSYCHOSES AND ONE WITH ACUTE DESTRUCTIVE BRAIN LESIONS

			Oxygen content, volumes per cent				Blood sugar		
Patient	Diagnosis	Date	Arterial	Venous	Difference	Average difference	Arterial	Venous	Comment
1	Pernicious anemia	9/19/40	4.14	1.87	2.27	...	131	127	Before therapy irrational and confused. After therapy no mental symptoms.
		9/20/40	4.96	2.15	2.81	2.54	...	...	
		10/15/40	13.85	6.49	7.36	...	...	...	
2	Cardiac decompensation	7/3/40	19.51	8.71	10.80	...	...	...	Circulation time 30 seconds.
		7/5/40	19.08	7.94	11.14	10.97	81	61	
3	Acute luetic encephalopathy	7/3/40	18.87	15.58	3.29	...	117	106	Loss of contact, forced grasping, and sucking, cogwheel rigidities.

[1] Read at the ninety-ninth annual meeting of The American Psychiatric Association, Detroit, Michigan, May 10-13, 1943.

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The second patient exhibited clouding of consciousness and other psychotic changes which developed during cardiac decompensation. His average venous oxygen content was reduced to 8.33 volumes per cent and his average oxygen difference increased above the normal value to 10.97 volumes per cent. That the mental changes were caused by slow cerebral blood flow is indicated by a circulation time, determined by potassium cyanide method, of 30 seconds, approximately twice as long as the normal. This patient did not respond to cardiac therapy and his psychosis was unchanged during his stay at the hospital.

The third patient revealed symptoms referable to destructive processes in the brain especially the cerebral hemispheres, a result of acute luetic encephalitis. His symptoms included loss of cerebral functions and release of subcortical mechanisms. This patient was not in contact with the environment and exhibited forced grasping, forced sucking and cogwheel rigidity. Encephalopathy due to niacin deficiency(3) was suspected but the patient did not improve after receiving niacin intravenously. The cerebral spinal fluid Wassermann was ++++. His brain was not removing oxygen from the blood probably because of the decrease in viable cerebral tissue, hence the high oxygen content of the cerebral venous blood, 15.58 volumes per cent, and the impaired uptake which was reduced to 3.29 volumes per cent.

DISCUSSION

For the brain to receive an adequate supply of oxygen at least two requirements must be fulfilled. The oxygen content of the arterial blood must be sufficient and the cerebral blood flow of normal rate. When these conditions are satisfied the cerebral arterio-venous oxygen difference is 6.7 volumes per cent(4, 5, 6) with an arterial value of 19.0 volumes per cent and a venous content of 12.3 volumes per cent. The results on patients 1 and 2 reveal venous oxygen contents below the average level. This is an indication that the oxygen supply of the brain is inadequate. In patient 1 this inadequacy is caused by the low oxygen content of the arterial blood and in patient 2 by the slow cerebral blood flow. The mental status of such patients may be restored if the underlying cause is removed. In fact an increase of the oxygen afforded the brain caused an alleviation of the symptoms in the patient with pernicious anemia. Bowman(7), as well as Herman, Most and Jolliffe(8) reported improvement of psychoses in patients with pernicious anemia after the reticulocyte response produced by adequate treatment. Similarly, Wortis(9) observed an amelioration of the mental symptoms accompanying cardiac decompensation following relief of the cardiac condition.

There is evidence that the brain functions at its best at a definite pressure of oxygen, the pressure which is found in cerebral tissues at sea level. In these two patients, oxygen content of the cerebral venous blood

TABLE II

HEMATOLOGIC DATA ON TWO SUBJECTS ILLUSTRATING THE EFFECT OF HIGH ALTITUDE ON THE GASEOUS EXCHANGE OF THE BRAIN

Patient	Oxygen content, volumes per cent: Arterial	Venous	Difference	Breathing
1	19.7	13.7	6.0	Air at sea level.
	17.3	11.5	5.8	Oxygen at 35,000 feet.
2	20.7	12.7	8.0	Air at sea level.
	18.6	11.9	6.7	Oxygen at 37,000 feet.

below the normal average value, indicates low oxygen pressure in the venous blood. The oxygen pressure in the cerebral venous blood is in equilibrium with that of the cerebral tissues(10). Consequently the brain of these patients was subjected to reduced oxygen pressures, reductions similar to those of people at high altitudes. Since changes of personality may develop, it is important to determine if these changes are associated with a diminished oxygen content of the cerebral venous blood. Two subjects, who were studied in a decompression chamber, breathed air at sea level pressure when the first pair of blood samples was drawn but respired oxygen via mask when the second pair was collected at simulated altitudes of 35,000 feet and 37,000 feet respectively. The inhalation of oxygen did not prevent the arterial and venous oxygen contents from diminishing at those high altitudes(11).

An inadequate arterialization of the blood in the lungs may be caused not only by a reduced pressure of oxygen in the inspired air as occurs at high altitudes but by changes occurring in any part of the respiratory apparatus beginning with the mouth and nose and ending in the pulmonary parenchyma. Cournand, Richards and Maier(12) describe a patient with tuberculosis who developed a psychosis with personality changes and delusions after artificial pneumothorax was administered as a therapeutic measure. Striking improvement followed re-expansion of the lungs and in four days the patient became mentally clear. The saturation of hemoglobin of his arterial blood going to the brain was reduced to 58 per cent while the patient exhibited delusions and rose to 90 per cent when he returned to a stable mental condition.

Patient 3 presents an entirely different phenomenon from the other patients. The high oxygen content of the venous cerebral blood and the reduced cerebral arterio-venous oxygen difference indicates that the brain failed to utilize the available oxygen because that organ had suffered degenerative changes. The alteration of the oxygen content of the venous cerebral blood is therefore the result and not the cause of the cerebral damage(13).

We(12) have previously reported the cerebral arterio-venous oxygen difference in three patients with changes in the brain, one following destructive effects of prolonged hypoglycemia and two others resulting from carbon monoxide poisoning. In each of these three patients the cerebral arterio-venous oxygen differences were diminished because of the relatively high oxygen content of the cerebral venous blood.

A comparison of the results on patients 1 and 2 (Table I) with those of patient 3 (Table I) and the three patients of Table III reveals that the oxygen content of the cerebral venous blood may, in such cases, be used as an indicator to determine whether the cerebral metabolic changes underlying acute mental episodes are primary or secondary. Low oxygen content of the venous blood indicates that the oxygen supplies to the brain are inadequate and that the cerebral metabolic changes are secondary to some extracerebral cause. High oxygen content suggests that the pathologic change is primary in the brain. This increase of the venous oxygen content applies especially to patients with acute destructive lesions. When the destructive process in the brain is of relatively slow development an adaptive alteration may occur in the cerebral circulation which is accordingly prolonged(14). As a result of the slow cerebral circulation the cerebral venous oxygen content may fall towards the normal value.

TABLE III

HEMATOLOGIC DATA ON THREE PATIENTS WHO DIED IN COMA

Patient	Diagnosis	Date	Oxygen content, volumes per cent: Arterial	Venous	Difference	Average difference	Blood pressure, mm. of mercury	Comment
1	Post hypoglycemic coma	2/15/39	....	....	...	...	122/90	On admission.
		3/20/39	14.28	11.18	3.10	...	130/90	Blood sugar 250 mg. per 100 cc. (after intravenous administration of dextrose).
		3/20/39	13.60	11.18	2.42	2.76	.....	
2	Carbon monoxide	1/15/39	....	....	...	...	120/60	On admission.
		1/20/39	16.68	13.60	3.08	...	168/68	
		1/21/39	15.52	13.12	2.40	3.05	158/40	
		1/22/39	14.70	11.02	3.68	...	178/78	
3	Carbon monoxide	7/28/39	....	....	...	...	112/70	On admission.
		7/29/39	18.41	16.62	1.79	1.79	110/74	

SUMMARY

The cerebral arterio-venous oxygen differences were determined on three patients with mental symptoms which appeared in the course of pernicious anemia, cardiac decompensation and luetic encephalopathy.

In the two patients with an extracerebral origin of the mental disturbances the oxygen content of the venous blood was subnormal while in the patient with an intracerebral process the venous oxygen content was above the normal value.

These observations suggest that a determination of the oxygen content of the venous cerebral blood may indicate whether the mental symptoms are produced by inadequate oxygen supply or result from changes in the brain, provided that alterations in the rate of blood flow do not obscure these indications.

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VARIATIONS IN THE GLUCOSE TOLERANCE OBSERVATIONS IN SCHIZOPHRENICS BEFORE AND AFTER SHOCK TREATMENT[1]

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There are several references in the literature regarding variations that occur in carbohydrate metabolism in the mentally ill(1, 2, 3, 4, 10). These observations usually have been made at only one point in the patient's illness and in such cases obtaining adequate controls proved so difficult as to be impracticable. In the data presented in this report, the patient serves as his own control, as we are reporting variations in the patient's glucose tolerance from the time of his admission until his discharge from hospital, or his commitment to a mental institution for further care. Reports have been published on glucose tolerance variations on small series of patients(5, 6, 7, 8, 9), before and after insulin shock therapy. These demonstrate that the glucose tolerance is more abnormal after than before this treatment, if the observations are made immediately following the termination of insulin therapy. However, one author(5) reports that the elevation of the glucose tolerance curve disappears two to ten months after cessation of insulin administration. Another(7) states that two to three weeks after insulin shock there begins a return to the pre-treatment glucose tolerance response. The use of insulin in the treatment of these patients complicates any observations concerning changes in carbohydrate metabolism. However, since this was a factor common to the groups being compared, the observed differences in tolerance must be ascribed to other than the after effects of insulin administration.

Materials and Methods

The groups of patients in this investigation consisted of schizophrenics, chiefly of the catatonic type, with periods of illness not exceeding three years. These patients did not receive insulin shock therapy previous to admission to the research unit. Their ages varied between 14 and 41 years. There were 32 males and 25 females. The results of tests made on menstruating patients have been excluded, except for one case when pre- and post-treatment glucose tolerance observations were done during her menstrual period and thus the conditions considered comparable. The patients were placed on a daily diet consisting of 80 grams of protein, 90 grams of fat and 175 grams of carbohydrate, for a week to ten days before the initial glucose tolerance observations. These tolerance tests were repeated on consecutive days to confirm the reliability of the tests.

Oral Glucose Tolerance Test.—The method of Hagedorn and Jensen was used for the determination of blood sugar. A fasting blood sample was collected, the weighed amount of glucose was given (30 grams per square metre of surface area), and specimens were collected at intervals of 15, 30, 45, 60, 75, 90, 105, 120, 150, and 180 minutes.

Intravenous Glucose Tolerance Test.—The method of Hagedorn and Jensen was again used for the sugar estimation. A fasting sample was collected, 10 grams of 50 per cent glucose was injected intravenously and specimens were collected, one immediately, and then at intervals of 5, 10, 15, 20, 25, 30, 35, 40, 50, and 60 minutes.

Several patients were given only routine hospital care, others insulin shock therapy, and still others were subjected to a course of electroshock involving 6 to 10 grand mals, after which a period of a week to two weeks' observation was allowed. At the end of this time, if the patient did not show a social remission he was placed on hypoglycemic shock therapy until 40 to 55 such treatments had been given. These treatments were given

[1] This work was made possible by a grant from the Rockefeller Foundation and has been directed by Prof. C. H. Best and Prof. C. B. Farrar.

Tuesday through Friday of each week, following the usual technique of starting at a dose of 20 units of Insulin-Toronto and working up to that dosage which produced a coma. Coma was allowed to persist up to 45 minutes and an endeavour was made to obtain 20 to 30 periods of coma. At the end of the hypoglycemic therapy, the patient was observed for three weeks and then for one week to ten days was placed on a diet identical with that used in conjunction with the pre-treatment glucose tolerance tests. Oral and intravenous glucose tolerance tests were then performed. Most of the observations are shown in the form of histogram diagrams. Each block represents the area under the tolerance curve from 0 to 120 minutes in the oral tolerance curves, and 10 to 50 minutes in the intravenous curves. The areas under the curve were considered to give more reliable information than a single point. Four patients included in our series have had bilateral frontal leucotomies following negative results from convulsive and/or insulin therapy.

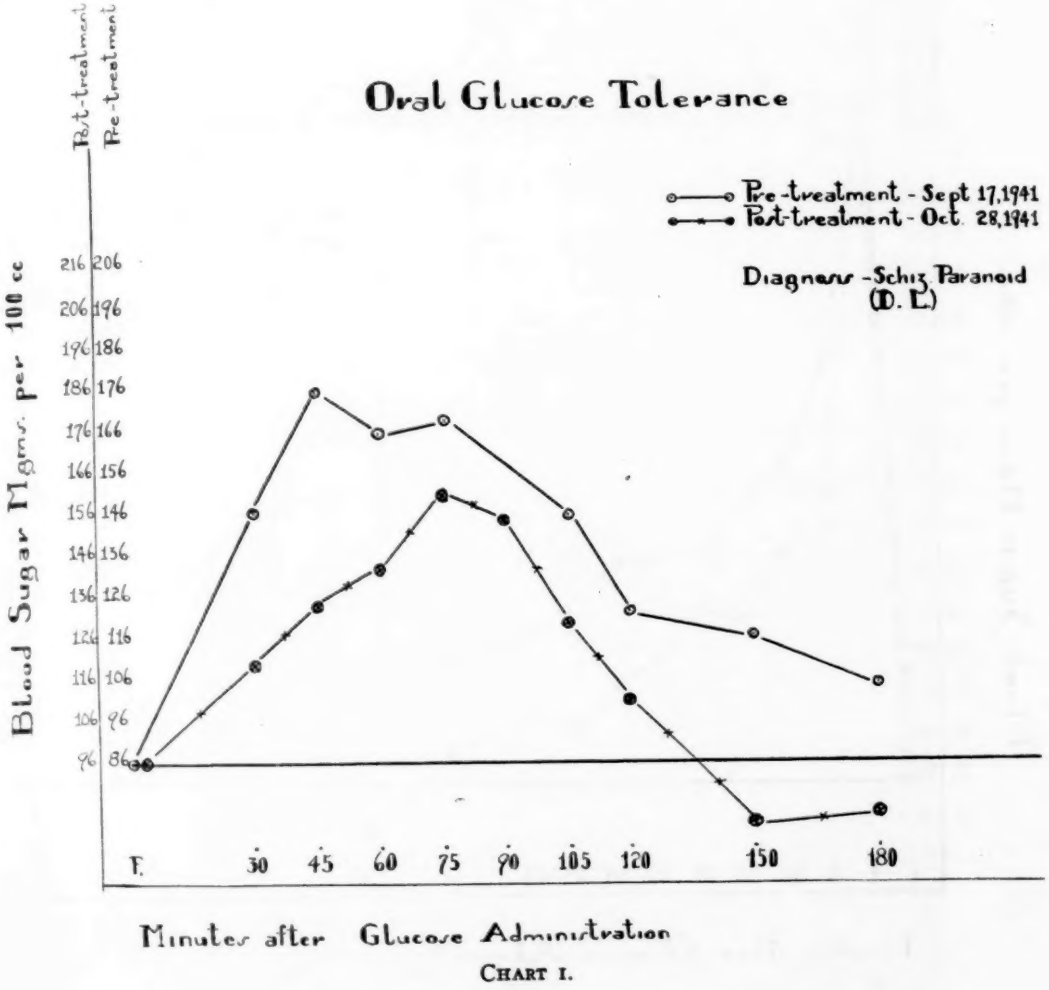

CHART 1.

RESULTS

Examples of tolerance tests are shown in Charts 1 and 2, and the entire group is depicted in a series of histograms in Charts 3 and 4. In Chart 1, the change in the oral glucose tolerance is depicted in a schizophrenic who is considered to be a complete remission following electroshock therapy. A comparison of the oral glucose tolerance is facilitated by observing the areas above the baseline of the graph involving identical

observation times in the pre- and post-treatment observations. In Chart 2, a similar comparison, using the intravenous glucose test, is demonstrated in a patient at the height of her mental illness and following her complete remission (insulin therapy only). It is obvious that there has been a change in the glucose tolerances of these patients, and this change is towards a more normal glucose tolerance and occurred following a full remission from a schizophrenic mental illness. The patient shown in Chart 1 did not receive insulin shock therapy, so that the change in her glucose tolerance could not be attributed to the effects of insulin. In Chart 3, the results of the oral glucose tolerance tests are presented in a series of histograms. The unshaded histogram represents the area under the tolerance curve obtained previous to treatment, and the shaded histogram depicts the area under the tolerance curve obtained at the time of discharge from the research unit. In Chart 4 similar data are given for the intravenous glucose tolerance tests. The results have been divided into 3 groups: group 1 consists of patients who had a complete remission; group 2 is made up of those patients who recovered to varying degrees but not completely; and group 3 includes those patients who showed no improvement, or, in some cases, deteriorated mentally during the treatment. It is apparent that the majority of the histograms in the recovered group shows a decrease in the area under the glucose tolerance curve following the patient's remis-

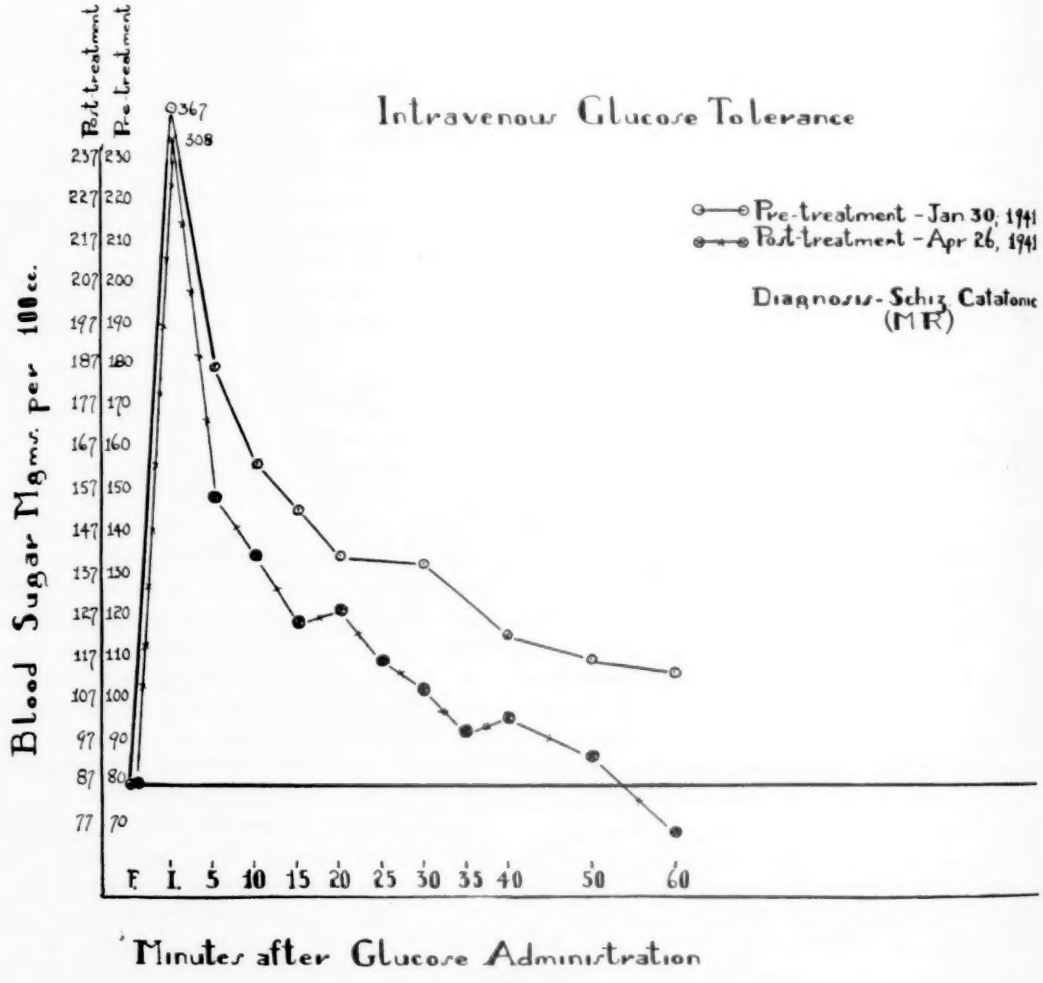

CHART 2.

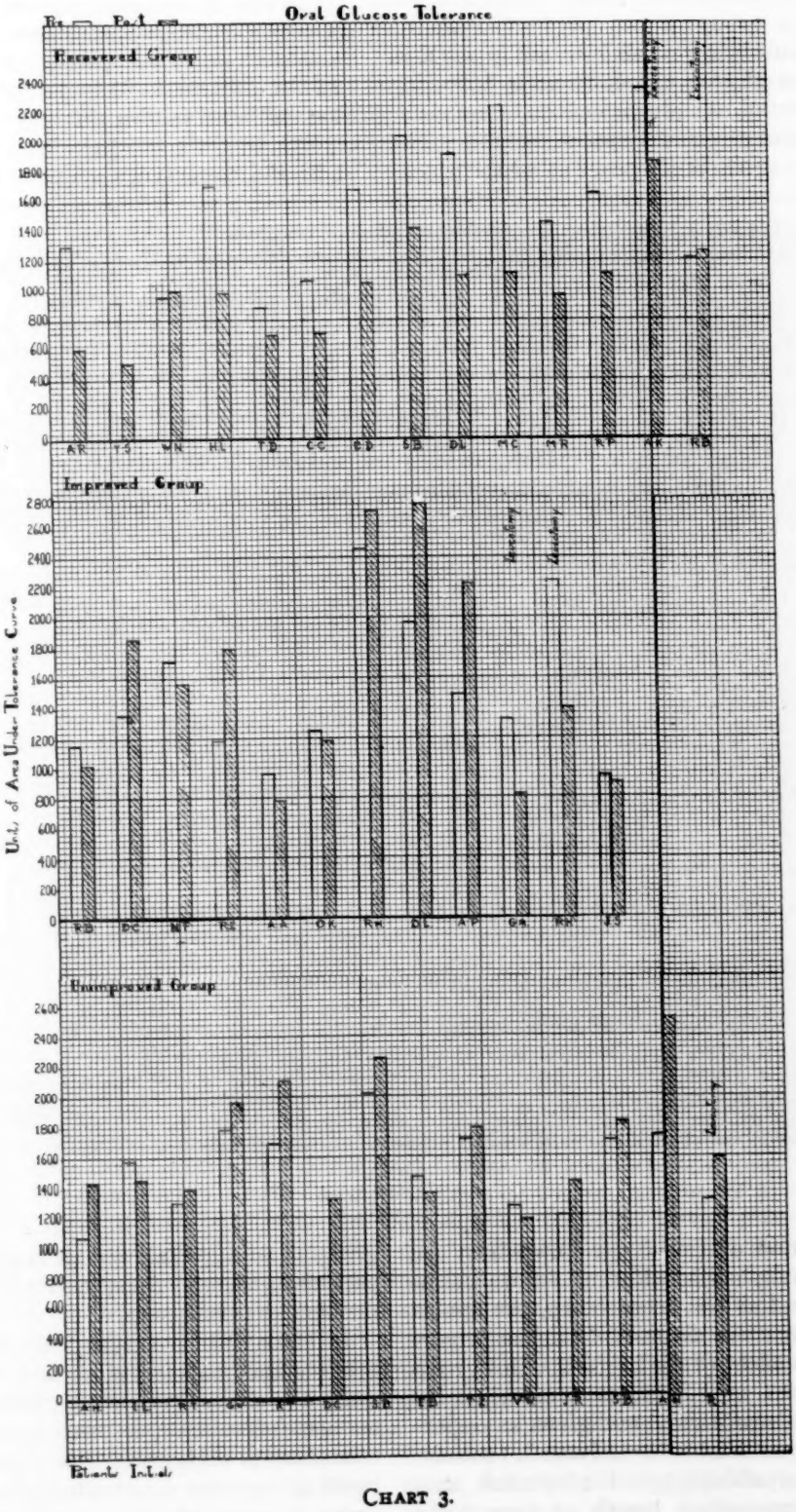
Oral Glucose Tolerance
Recovered Group
Improved Group
Unimproved Group
Units of Area Under Tolerance Curve

CHART 3.

sion from his mental illness, while the unimproved group shows predominantly no significant change or an increase in the area under the glucose tolerance curve following treatment.

One group requires special mention. The improved group is composed of a heterogeneous collection of cases, some of whom are fundamentally still suffering from schizophrenia, and as has been shown, are unable to carry on when divorced from the protective environment of the hospital. This group also contains some patients who, when relieved of this protection and given an opportunity to establish themselves in society, make a surprisingly good adaptation, and after an appropriate length of time could be considered complete remissions. Only the patients who have been discharged for three months or more are included in the results, and the patients have been regrouped from time to time as the social service worker reports on their progress in other hospitals or in the community. Since the improved group is an uncertain one, it is best to compare the group of complete remissions with the unimproved group.

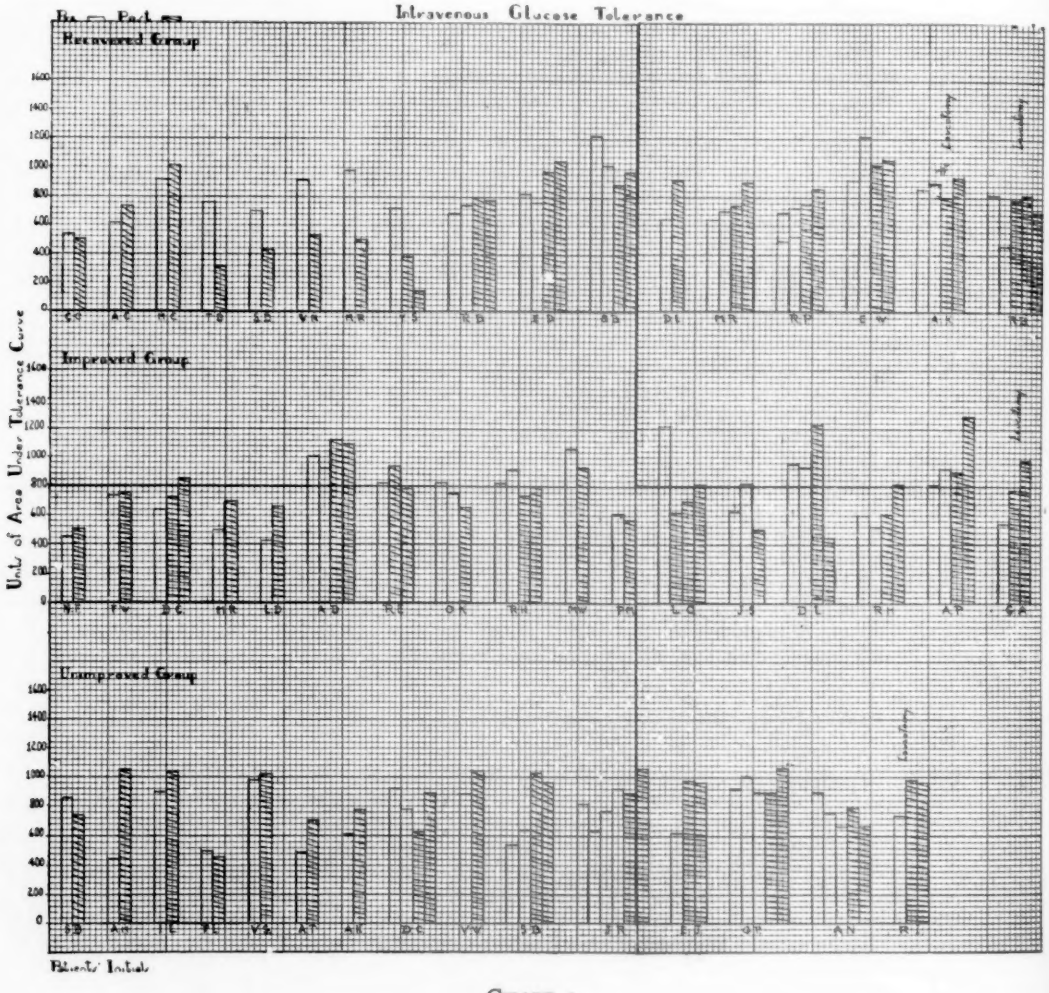

CHART 4.

In Table 1, the averages of the areas under the tolerance curves before and after treatment are shown. A direct comparison can be made between pre- and post-treatment tolerances in each group and differences between groups are easily observed. The area under the oral glucose tolerance curve has

decreased following treatment by approximately 32 per cent in the recovered group. In the improved group there has been an increase of about 5 per cent, and in the unimproved group there has been an increase of approximately 14 per cent. The area under the intravenous glucose tolerance curves following treatment shows a decrease of approximately 8 per cent in the recovered group, no significant change in the improved group and an increase of approximately 23 per cent in the unimproved group.

The oral glucose tolerance observations have been treated statistically, and using the t formula, a P of less than .001 was obtained, thus denoting that our results are highly significant. The intravenous glucose tolerance observations, similarly treated showed a P of between .1 and .2, thus denoting that the results in the present series are not significant. Only the recovered and unimproved groups were examined in this way.

TABLE 1

COMPARATIVE AREAS UNDER GLUCOSE TOLERANCE CURVES

		Units of area	
		Oral	Intravenous
Recovered	Pre-treatment	1536	780
	Post-treatment	1034 (14) Cases	718 (17)
Improved	Pre-treatment	1503	756
	Post-treatment	1579 (12)	779 (17)
Unimproved	Pre-treatment	1472	728
	Post-treatment	1680 (14)	893 (15)

DISCUSSION

The variations occurring in the glucose tolerance appear to bear a relationship to the clinical change in our schizophrenic patients. This change in tolerance in the group showing complete remission is all the more remarkable in view of the reports in the literature(5, 7) concerning reduced glucose tolerance following insulin shock therapy. There are patients in this group who have only received electroshock therapy, and who showed an improved glucose tolerance along with a complete clinical remission. Finally, there are several cases who improved on psychotherapy and routine hospital care alone, who showed an improvement in their glucose tolerance coincident with a complete remission from their mental abnormalities.

Although the significant difference seen in the oral glucose tolerance observations is not apparent statistically in the intravenous glucose tolerance observations in the small series to date, superficially there is an improvement in the intravenous glucose tolerance with the appearance of clinical improvement. Should this be borne out statistically when our series has been enlarged, we could then consider that the change in glucose tolerance following this clinical improvement was not attributable entirely to a change in absorption of glucose from the gastrointestinal tract.

On numerous occasions a patient who seemed to have improved clinically, but who showed a significant *decrease* in glucose tolerances coincident with this clinical improvement, subsequently relapsed. The glucose tolerance observations in such cases therefore seemed of some prognostic value. The decrease in glucose tolerance in these patients appeared to indicate the lack of a fundamental change in the patient's condition. Such patients have required further continuous supervision at home or in a mental hospital because of their schizophrenic psychosis.

There have been cases in which there was no significant change in the glucose tolerance and yet the patient has recovered or improved. We are not aware of the explanation for such phenomena and these cases are being closely followed in an endeavor to see if they are significantly different from the psychiatric viewpoint.

We are submitting this paper, realizing that the number of patients in our series is small, but they do suggest the probability that there is a change in the carbohydrate

metabolism in the majority of patients who make a complete remission from their mental abnormalities. This change is towards a more normal glucose tolerance. In those cases who obviously deteriorate, the glucose tolerance remains or becomes more abnormal. It may be mentioned that the pre-treatment glucose tolerance curves in the schizophrenic patients studied in this series seem to be prolonged as judged by other reports on normals, but no controls for this observation have as yet been done in our own series.

Summary

1. The majority of schizophrenic patients who improved clinically, showed a significant change in their oral glucose tolerance, this change being towards the normal.

2. In the occasional case, clinical improvement did occur without any significant change in the glucose tolerance.

3. Those who did not improve or deteriorated clinically, showed no change in their abnormal tolerance or it became more abnormal.

4. This change could not be attributed to the administration of insulin *per se,* nor entirely to the change in absorption of the glucose in the gastro-intestinal tract.

5. The pre-treatment glucose tolerance curves in this series of schizophrenics, seem to show an abnormally prolonged period before the return to fasting levels.

Conclusion

A series of observations on the glucose tolerance, intravenous and oral, on a group of schizophrenic patients before and after treatment, is presented. The group is small and we present this report as a preliminary one, but believe it suggests that there is a significant correlation between the change in the glucose tolerance test and the clinical changes noted in these patients.

We wish to express our appreciation to Dr. R. E. Haist, of the Department of Physiology, University of Toronto, for his many helpful criticisms and suggestions during the preparation of this paper.

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THE EFFECT OF PLEASANT AND UNPLEASANT IDEAS ON THE RESPIRATORY PATTERN (SPIROGRAM) IN PSYCHONEUROTIC PATIENTS[1]

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The effects of ideational and painful stimuli on respiration in psychoneurotic patients have been reported in previous studies(1, 2, 3). Data were presented upon the effect of these stimuli on the rate and depth of respiration, the ventilation, oxygen consumption, and the expiratory-inspiratory angle. More recently a method has been elaborated for the objective appraisal of the respiratory pattern itself. This method, which enables one to reduce to quantitative and reproduceable terms the degree of irregularity in the breathing patterns, has been used in the evaluation of respiratory tracings in psychoneurotic and schizophrenic patients and in a series of normal control subjects(4). The present study represents the application of the same method to a series of tracings obtained on psychoneurotic patients and normal controls during periods of induced ideational stimuli.

Several reports on the effect of various type of ideational stimuli on respiratory tracings in normal individuals and in psychiatric patients have appeared(5, 6, 7, 8, 9, 10). As a rule the observations have been limited to measurements of the rate, depth, ventilation or oxygen consumption(11, 12, 13, 14, 15, 16). The appraisal of the spirogram pattern itself has been limited to statements based essentially on inspection, from which have been derived classifications of respiratory tracings(17, 18, 19, 20). Some authors have been concerned with specific details such as sighing respiration(21, 22, 23), the inspiration-expiration ratio(24, 25), expiratory tips(18), inspiratory and expiratory hooks(19), or respiratory plateaux(26). In the present study comparisons are made of the degree of irregularity occurring during periods of induced pleasant and unpleasant ideas with an initial preliminary period and a final period of induced relaxation.

Method of Analyzing the Respiratory Tracings

A complete description of the method, which can be applied to spirogram samples of 3 minutes duration or longer, has been presented at length in an earlier publication(4). The method was elaborated on tracings obtained by means of a Warren-Collins respiration apparatus, but can also be used on records obtained from other types of apparatus, such as the Sanborn or the White. In the Warren-Collins apparatus the upstroke of the pen represents the inspiratory phase; the downstroke represents the expiratory phase. The transition from inspiration to expiration occurs at the upper border of the tracings, and the transition from expiration to inspiration occurs at the lower border of the tracings.

Two reference lines are drawn so as to touch the greatest number of transition points at the top and bottom of the spirogram. The following items are measured:

1. *Sighing Respirations.*—A sighing respiration is defined as one in which the vertical projection of the inspiration line is twice or more the vertical distance between the two reference lines measured at the midpoint of the minute in which the sigh occurs.

2. *Minor Fluctuations.*—These are the abrupt and short irregularities which appear like spikes or notches in the tracings. A minor fluctuation involves three or four consecutive points. When three points are involved the middle point must be elevated above the others by at least 4 mm. or depressed below them by the same amount. When four points are involved only one of the middle two points need show this deviation above or below the first and fourth points. These minor fluctuations are counted independently for the upper and lower

[1] This is the fifth in a series of studies on respiration in psychoneurotic patients.

From the Department of Diseases of the Nervous System, Harvard Medical School, and the Psychiatric Department, Massachusetts General Hospital.

borders. The determination of minor fluctuations is independent of the lines of reference.

3. *Major Fluctuations.*—These are the large wave-like irregularities readily seen on inspection. Each major fluctuation is defined as a succession of respirations in which at least three consecutive points deviate in the same direction from the line of reference and for which the deviation measures at least 4 mm. for one or more of these points. A major fluctuation ends when three or more points touch the line or deviate from the line in a direction opposite to that of the major fluctuation. The fluctuations are counted independently for the points in the upper and lower borders, and are referred to as upper major fluctuations and lower major fluctuations.

4. *Points Off the Reference Lines.*—For each minute of the tracing the number of upper points that do not touch the reference line (projecting or falling short of it by at least 1 mm.) are counted. If these are present 50 per cent or more of the total number of points present for the minute a rating of 1 is given for the minute. If these represent less than 50 per cent of the total number of points present, a rating of zero is given. These too are evaluated independently for the upper and lower borders of the record. These variables can all be treated independently or can be added to give a value for the total score.

Description of Experiment

The technique of the experiments has been described in detail(1). The patients and control subjects, all of whom had previous experience with the apparatus, were interviewed and asked to state what ideas came to mind on being asked to think of pleasant ideas and of unpleasant ideas. The statements were recorded, and the subjects, who were all under basal conditions, were connected to the apparatus. After a preliminary period of breathing lasting from 3 to 6 minutes the instruction "think of pleasant ideas" or "let pleasant ideas come into your head" was given every 15 seconds for a period of from 3 to 6 minutes. After this period, without disconnecting the subject, the instruction "think of unpleasant ideas" or "let unpleasant ideas come into your head" was given for a similar period. This "unpleasant" period was followed by a second pleasant period lasting from 3 to 6 minutes, which in turn was followed by a similar period during which the subject was instructed "just relax." At the end of the "relaxed" period the subject was disconnected and asked to report on the ideas present during each of the periods. The length of the periods in most cases was 3 minutes. In a few cases in which the duration of the periods was 6 minutes the results obtained for each of the items was divided by 2 to obtain uniformity in the results. The records were then evaluated for irregularities in breathing for each of these periods.

Data

The subjects included 64 psychoneurotic patients and 24 persons used as controls. The patients, all of whom were studied in the psychiatric department of the Massachusetts General Hospital, were divided into two groups. Group I includes 43 patients (30 females, 13 males, age range 18-42) whose hospital diagnoses were anxiety neurosis, hysteria or reactive depression. There were 27 anxiety neuroses, 12 patients with hysteria and 4 with reactive depression. Group II included 21 patients (12 females, 9 males, age range 18-40) whose diagnoses were hypochondriasis, compulsion neurosis or questionable schizophrenia. There were 14 patients with hypochondriasis, 4 compulsion neurosis and 3 patients with a diagnosis of questionable schizophrenia. The control subjects consisted of physicians, social workers and medical students who in a brief preliminary interview disclosed no obvious psychoneurotic symptoms. They were not subject to a medical examination. This group consisted of 10 males and 14 females. The ages ranged from 18 to 37.

The data are summarized in Tables I to VI, and in Figs. 1 to 5.

I. SIGHING RESPIRATIONS

The mean number of sighs during the preliminary period was comparable for the three groups of subjects, being somewhat lower for the controls than for the patients (Table I).

The number of sighs changed during the periods of ideational stimulation for the patients of Group I and for the controls, but not significantly for the patients of Group II. For the patients of Group I the number of sighs reached a peak during the unpleasant period, dropping slightly below the preliminary value for the two pleasant periods, but rising appreciably again during the final relaxed period (Table I). The reliability of the values obtained for this increase during the unpleasant period as compared with the other periods is shown by critical ratios of between 3 and 3.8, and a biserial coefficient of correlation of .28 and .32 (Table V). An increase in the number of sighs appeared also for the controls during the unpleasant period, but for this group the peak was nearly sustained for the rest of the experiment, with no appreciable drop during the second pleasant period. The increase from first pleasant to unpleasant period showed a critical ratio of 5.1 and a biserial coefficient of .55 (Table V).

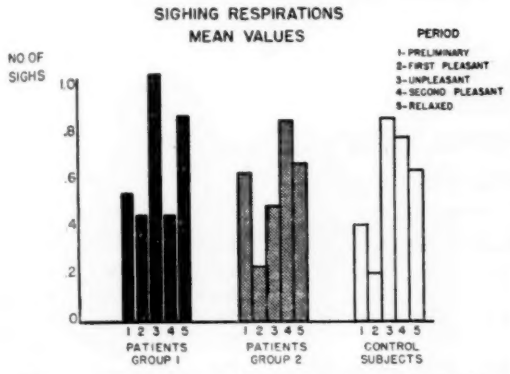

FIG. 1.—Chart showing mean values for sighing respirations during each period for patients of Group I, for patients of Group II, and for the control subjects.

2. MINOR FLUCTUATIONS

The mean value for the number of minor fluctuations in the upper border found for the preliminary period was roughly the same for the three groups of subjects. It ranged from 3 for the patients of Group I to 2.7 for the patients of Group II, and was 2.9 for the controls (Table II). For each group of subjects the mean value of these fluctuations showed changes during the periods of the experiment, the changes being again most pronounced for the Group I patients, while the Group II patients reacted to about the same degree as the controls. For the patients of Group I the fluctuations rose to a pronounced peak of 6.7 during the unpleasant period (Table II). The critical ratio for the comparison with the preliminary value was 6.6 (biserial coefficient of correlation, .55), which can be considered as highly reliable (Table V). For the two pleasant periods and the relaxed period there was no significant difference from the preliminary value for these patients. For the other two groups of subjects the mean value was also greatest during the unpleasant period, but the changes were quantitatively small, and the statistical reliability of the changes as gauged by the critical ratios was not great (Table V). Nevertheless, these two groups did show consistently the pattern of change that appeared so strikingly for the Group I patients, namely, an increase limited to the unpleasant period, with a subsequent return during the second pleasant and relaxed periods. For the controls the higher value for the unpleasant period showed up not so much in comparison with the preliminary value, as in comparison with the low values that occurred during the two pleasant periods.

TABLE I

SIGHING RESPIRATIONS

MEAN VALUES AND STATISTICAL VARIABLES

Periods	Patients—Group 1				Patients—Group 2				Control subjects			
	Mean	Range	S.D.	P.E.	Mean	Range	S.D.	P.E.	Mean	Range	S.D.	P.E.
Preliminary	0.6	0-3.5	0.9	0.1	0.6	0-3	1.0	0.2	0.4	0-4	0.9	0.1
First pleasant	0.5	0-4.5	0.8	0.1	0.2	0-1	0.4	0.1	0.2	0-1	0.4	0.1
Unpleasant	1.1	0-5	1.3	0.1	0.5	0-3	0.8	0.1	0.9	0-3	0.8	0.1
Second pleasant	0.5	0-2	0.6	0.1	0.9	0-2	0.6	0.1	0.8	0-6	1.5	0.3
Relaxed	0.9	0-4	1.3	0.2	0.7	0-3	1.0	0.2	0.7	0-4	1.1	0.2

At the lower border of the respiratory curve there occurred fewer minor fluctuations throughout, the mean number for the preliminary period being 0.7 for the Group I patients and 0.4 for the Group II patients and the controls. For the patients of Group I the pattern of the changes occurring in this function during the experiment was similar to that found for the minor fluctuations at the upper border, namely, an increase to 1.7 during the unpleasant period (Table II) the reliability of which was confirmed by a critical ratio of 4.1 (biserial coefficient of correlation .35) with respect to the preliminary period, and a return to a lower value during the two final periods. The values for the other two groups were also greater for the unpleasant period than for the preliminary and pleasant periods, but the differences were negligibly small, and the statistical reliability insignificant, especially in the case of the controls.

TABLE II

MINOR FLUCTUATIONS

MEAN VALUES AND STATISTICAL VARIABLES

Minor Fluctuations—Upper

Periods	Patients—Group 1				Patients—Group 2				Control subjects			
	Mean	Range	S.D.	P.E.	Mean	Range	S.D.	P.E.	Mean	Range	S.D.	P.E.
Preliminary	3.0	0-10	2.6	0.3	2.7	0-9	2.6	0.4	2.9	0-9	2.4	0.3
First pleasant	3.4	0-14	3.5	0.4	2.5	0-9	2.5	0.4	2.3	0-7	2.0	0.3
Unpleasant	6.7	0-20	4.7	0.5	3.4	0-13	3.0	0.4	3.1	0-9	2.4	0.3
Second pleasant	3.2	0-16	4.0	0.6	2.7	0-9	2.6	0.5	2.4	0-6	1.9	0.3
Relaxed	3.3	0-14	3.1	0.4	2.9	0-8	2.6	0.5	2.9	0-8	2.3	0.4
Minor Fluctuations—Lower												
Preliminary	0.7	0-8	1.4	0.1	0.4	0-4	0.9	0.1	0.4	0-2	0.6	0.1
First pleasant	1.0	0-7	1.7	0.2	0.4	0-3	0.7	0.1	0.4	0-2	0.7	0.1
Unpleasant	1.7	0-8	2.0	0.2	0.7	0-4	1.2	0.2	0.5	0-3	0.9	0.1
Second pleasant	0.6	0-2	0.9	0.1	0.2	0-1	0.4	0.1	0.4	0-2	0.6	0.1
Relaxed	0.8	0-6	1.4	0.2	0.9	0-7	1.8	0.3	0.4	0-2	0.6	0.1

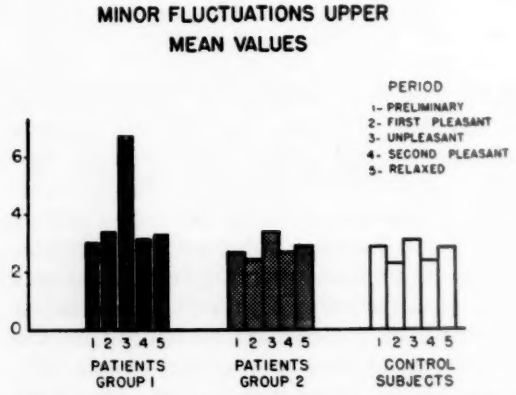

FIG. 2.—Chart showing mean values for minor fluctuations upper during each period for patients of Group I, patients of Group II, and for the control subjects.

3. MAJOR FLUCTUATIONS

The mean value for the major fluctuations at the upper border during the preliminary period was practically identical for the three groups of subjects, being 1.8 and 1.9 for the two groups of patients and 1.8 for the controls. The controls showed no significant change in this value during the course of the experiment. Both groups of patients, on the other hand, repeated the pattern of increase in fluctuations during the unpleasant period. The value for this period was 3.0 for Group I and 2.7 for Group II. The critical ratio for this increase over the preliminary value was 4.9 (biserial coefficient .43) for Group I and 3.0 (biserial coefficient .37) for Group II (Table III). The decrease in major fluctuations that followed the unpleasant period was not so pronounced for the Group I patients as for the Group II patients, but the latter showed a second increase during the relaxed period. As in the case of the minor fluctuations, the level during the preliminary period

was lower for the lower border of the curve than for the upper border, being 0.8 for Group I and 0.5 for Group II and for the controls. The changes that occurred during the experiment followed for each group of subjects the same trend for a maximum for the unpleasant period. For Group I the change was greatest and carried the greatest statistical significance. In general at both upper and lower borders the changes in major fluctuations were less pronounced than those found for the minor fluctuations.

4. POINTS OFF THE LINE

Group I patients did not show the highest values for points off the upper line during the preliminary period (Table IV). The changes involved during the experiment were, however, once more greatest for Group I with a moderate increase during the unpleasant period followed by lower values for the last two periods. The critical ratio for the change from the preliminary value was 4.9 (biserial coefficient of correlation 0.44). The only changes for the other two groups were a slight drop during the first pleasant period, the usual increase for the unpleasant period being absent for this function. At the lower border the number of points off the reference line was slightly greater for Group I during the preliminary period. The usual small increase for the unpleasant period was present in patients of Group I, and to a lesser degree for the controls.

Summary.—A comparison of the mean values for the different periods indicates that patients of Group I showed the greatest and most consistent changes for almost all of the items measured. In this group of patients the most consistent change seen was an increase during the unpleasant period when compared with its preceding pleasant period and as a rule with the preliminary period.

TABLE III

MAJOR FLUCTUATIONS

MEAN VALUES AND STATISTICAL VARIABLES

Major Fluctuations—Upper

Periods	Patients—Group 1				Patients—Group 2				Control subjects			
	Mean	Range	S.D.	P.E.	Mean	Range	S.D.	P.E.	Mean	Range	S.D.	P.E.
Preliminary	1.8	0-5	1.4	0.1	1.9	0-5	1.3	0.2	1.8	0-4	1.0	0.1
First pleasant	2.0	0-7	1.6	0.2	2.0	0-6	1.3	0.2	1.7	0-3	1.0	0.2
Unpleasant	3.0	0-9	1.8	0.2	2.7	1-6	1.2	0.2	1.9	0-5	1.3	0.2
Second pleasant	2.4	0-7	1.5	0.2	1.5	0-3	1.0	0.2	2.0	0-5	1.2	0.2
Relaxed	2.3	0-6	1.7	0.2	2.6	1-6	1.3	0.2	1.6	0-3	1.0	0.2

Major Fluctuations—Lower

Preliminary	0.8	0-3.5	0.9	0.1	0.5	0-3	0.8	0.1	0.5	0-2.5	0.7	0.1
First pleasant	0.7	0-3	0.8	0.1	0.7	0-4	1.0	0.2	0.4	0-2	0.7	0.1
Unpleasant	1.2	0-6	1.2	0.1	0.8	0-4	1.1	0.2	0.6	0-2	0.8	0.1
Second pleasant	0.8	0-3	0.8	0.1	0.5	0-2	0.7	0.1	0.3	0-2	0.6	0.1
Relaxed	1.0	0-6	1.5	0.2	0.4	0-2	0.7	0.1	0.3	0-2	0.7	0.1

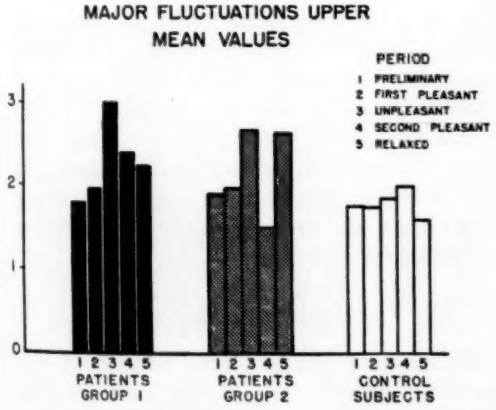

FIG. 3.—Chart showing mean values for major fluctuations upper during each period for patients of Group I, patients of Group II, and for the control subjects.

Consistent decreases were also seen on comparing the second pleasant period with the preceding unpleasant period. The changes during the relaxed period were not nearly as consistent as the changes during the other periods. The values for items of the upper border and the changes during different periods were greater than those found for the items of the lower border. With few exceptions the changes between the unpleasant period and the preliminary, first, and second pleasant periods had critical ratios of 2.5 and in eight instances the critical ratio was over 4.

The patients in Group II and the control subjects showed some changes during the various periods. In almost all of the items the mean values were less than those of patients in Group I. With few exceptions there was little difference between the values for Group II and the control subjects. On comparing the various periods for patients of Group II, critical ratios of 2.5 and over were found in only five instances, and a critical ratio of 4 or over was found in only one instance (major fluctuations upper on comparing the unpleasant period with the second pleasant period). In the control subjects critical ratios of 2.5 and over were found in four instances and, in only one instance was a critical ratio greater than 4 found (sighing respirations on comparing the unpleasant with the first pleasant period).

TABLE IV

POINTS OFF LINE

MEAN VALUES AND STATISTICAL VARIABLES

Points Off Upper Line

Periods	Patients—Group 1				Patients—Group 2				Control subjects			
	Mean	Range	S.D.	P.E.	Mean	Range	S.D.	P.E.	Mean	Range	S.D.	P.E.
Preliminary	1.9	0-3	1.0	0.1	2.2	0-3	1.1	0.2	2.0	0-3	0.9	0.1
First pleasant	1.8	0-3	1.2	0.1	1.5	0-3	1.1	0.2	1.5	0-3	1.0	0.2
Unpleasant	2.6	0-3	0.8	0.1	2.0	0-3	1.0	0.2	1.7	0-3	1.1	0.2
Second pleasant	2.0	0-3	0.9	0.1	1.9	0-3	1.2	0.2	2.0	0-3	1.1	0.2
Relaxed	2.1	0-3	0.9	0.1	1.9	0-3	0.9	0.2	1.7	0-3	1.0	0.2
Points Off Lower Line												
Preliminary	0.9	0-3	1.1	0.1	0.6	0-3	0.9	0.1	0.4	0-3	0.7	0.1
First pleasant	0.8	0-3	1.0	0.1	0.6	0-3	0.9	0.1	0.5	0-3	0.9	0.1
Unpleasant	1.3	0-3	1.1	0.1	0.6	0-3	0.9	0.1	0.8	0-3	1.0	0.1
Second pleasant	0.8	0-3	1.0	0.1	0.6	0-2	0.7	0.1	0.5	0-2	0.7	0.1
Relaxed	1.0	0-3	1.0	0.1	0.6	0-3	1.0	0.2	0.2	0-1	0.4	0.1

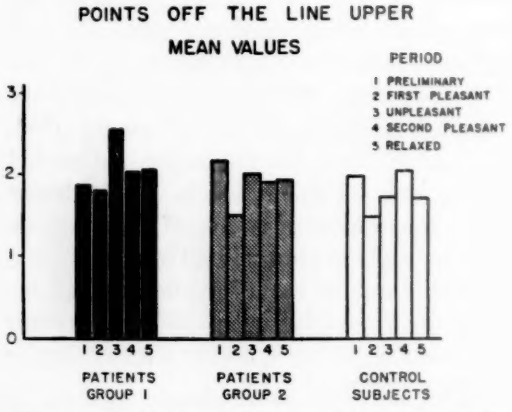

FIG. 4.—Chart showing mean values for points off the upper line during each period for patients of Group I, patients of Group II, and for the control subjects.

DISCUSSION

The present study offers additional evidence to support the thesis that psychoneurotic patients may be divided into two groups in respect to their reactions to induced ideational stimuli. The patients of Group I show greater reactivity during the unpleasant period in almost every item of the spirogram tracing that has been investigated. Not only do they show greater reactivity, but they also show a greater spread of values as evidenced by the standard deviations.

TABLE V

CRITICAL RATIOS AND BISERIAL COEFFICIENTS OF CORRELATION

	SIGHING RESPIRATIONS			POINTS OFF LINE—UPPER		
	Patients, Group I	Patients, Group II	Control subjects	Patients, Group I	Patients, Group II	Control subjects
Preliminary *vs.* First pleasant.....	0.7	2.5	1.6	0.3	2.8	2.7
		.32*			.36*	.33*
Unpleasant *vs.* Preliminary.....	3.0	—0.7	2.8	5.3	—0.8	—1.4
	.28*		.31*	.44*		
Unpleasant *vs.* First pleasant.....	3.5	2.0	5.1	4.9	2.2	1.2
	.32*		.55*	.44*		
Unpleasant *vs.* Second pleasant.....	3.8	—2.1	0.3	3.5	0.3	—1.3
	.32*			.38*		
Unpleasant *vs.* Relaxed.....	0.9	—0.9	1.1	0.4	0.3	0.1

	MAJOR FLUCTUATIONS—UPPER			MINOR FLUCTUATIONS—UPPER		
Preliminary *vs.* First pleasant.....	—0.7	—0.3	0.1	—0.8	0.4	1.2
Unpleasant *vs.* Preliminary.....	4.9	3.0	0.4	6.6	1.2	0.5
	.43	.37*		.55*		
Unpleasant *vs.* First pleasant.....	3.9	2.6	0.5	5.3	1.6	1.8
	.37*	.34*		.47*		
Unpleasant *vs.* Second pleasant.....	2.1	4.3	—0.5	4.8	1.0	1.5
		.55*		.45*		
Unpleasant *vs.* Relaxed.....	2.6	0.1	1.1	5.4	0.8	0.6
	.25*			.48*		

The value for the biserial coefficient of correlation is indicated by an asterisk (*).

During the period of induced unpleasant ideas the tracings tend to become much more irregular. The greater irregularity seen during the unpleasant period tends to flatten out during the second pleasant period. The relaxed period as a rule shows less irregularity than the unpleasant period, but more than the preliminary and the two pleasant periods. The increase in sighing respirations for all patients and control subjects indicates that ideational stimuli of an unpleasant kind are associated with an increase in sighing respirations as well as with greater irregularity in other aspects of the spirogram.

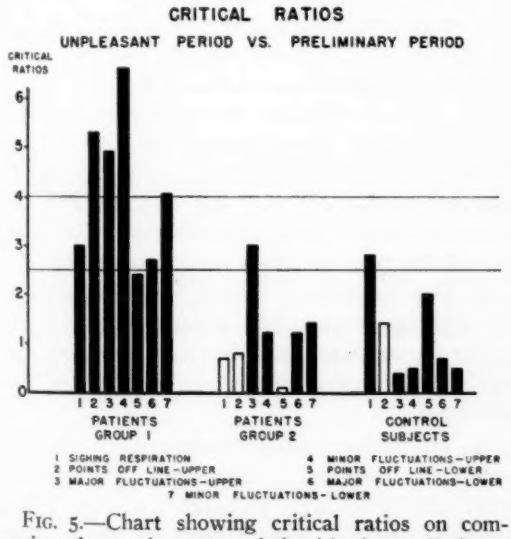

FIG. 5.—Chart showing critical ratios on comparing the unpleasant period with the preliminary period for all seven variables of the spirogram tracing. Negative values are charted in white.

For almost all of the variables there was no considerable difference between the mean values of the first and second pleasant periods. The relaxed period did not show a consistent trend in the variables in all groups of subjects. The most striking and consistent results seemed to be the increase in value for the variables during the unpleasant period. The subjective reports of the patients and controls indicate that during the first pleasant and during the unpleasant periods the ideas present were in line with the suggestions and tended to be stereotyped(1). During the second pleasant period and the relaxed period the ideas tended toward greater divergence and in some cases the subjects reported that they were unable to return to the pleasant ideas immediately after the preceding unpleasant period. During the relaxed period a great variety of ideas were present. This might be due to the fact that no ideational suggestion was given during this

period. The subjects were merely told to relax.

It would thus appear that patients with hysteria and anxiety neurosis and reactive depression (Group I) react to unpleasant ideational stimuli with an excessive respiratory lability as gauged by a greater irregularity of the respiratory pattern itself as well as by changes in rate, depth, ventilation, and oxygen consumption (1). Patients whose diagnoses were compulsion neurosis, hypochondriasis and questionable schizophrenia (Group II) were less reactive than the control subjects in respect to rate, depth and total ventilation (1). As to the spirogram pattern, there were only slight differences between the patients of Group II and the control subjects, and these differences were not consistent.

TABLE VI

CRITICAL RATIOS AND BISERIAL COEFFICIENTS OF CORRELATION

	Points off line—lower			Major fluctuations—lower			Minor fluctuations—lower		
	Patients, Group I	Patients, Group II	Control subjects	Patients, Group I	Patients, Group II	Control subjects	Patients, Group I	Patients, Group II	Control subjects
Preliminary *vs.* First pleasant.....	0.5	0.4	—0.3	1.0	1.0	0.7	—1.4	0.2	0.5
Unpleasant *vs.* Preliminary.....	2.4	—0.1	2.0	2.7	1.2	0.7	4.1	1.4	0.5
				.24*			.35*		
Unpleasant *vs.* First pleasant.....	2.9	0.3	1.5	3.6	0.2	1.4	2.5	1.6	0.9
	.28*			.33*			.23*		
Unpleasant *vs.* Second pleasant.....	2.5	0.6	1.2	2.6	1.5	1.7	4.5	2.7	0.8
	.26*			.23*			.38*	.31*	
Unpleasant *vs.* Relaxed.....	1.7	—0.2	3.9	0.8	1.6	1.7	3.5	—0.4	1.1
			.45*				.32*		

The value for the biserial coefficient of correlation is indicated by an asterisk (*).

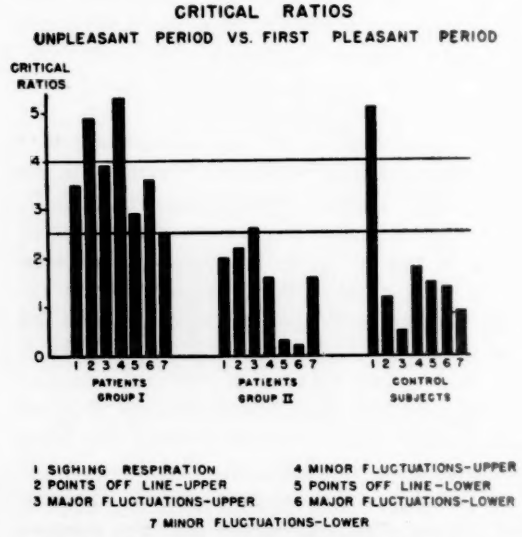

FIG. 6.—Chart showing critical ratios on comparing the unpleasant period with the preceding first pleasant period for all seven variables of the spirogram tracing.

SUMMARY

1. The spirogram tracings were analyzed for irregularities in pattern in a series of 64 psychoneurotic patients and 24 normal control subjects during periods of induced ideational stimuli. During the second, third and fourth periods, the subjects were directed to think of pleasant, unpleasant, and again of pleasant ideas. During the first period no direction was given, and during the last period the patients were asked to relax.

2. The respiratory tracings were analyzed for sighing respirations, minor fluctuations, major fluctuations, and points off an arbitrary line for the upper and lower border of the tracings.

3. The most consistent changes were observed on comparing the unpleasant period with its preceding pleasant period. Significant changes were found in all of the items in 43 patients (Group I) with diagnoses of hysteria, anxiety neurosis and reactive depression. In the remaining 21 patients (Group II) whose diagnoses were hypochondriasis, compulsion neurosis and questionable schizophrenia, a significant change was found in only two items on com-

paring the tracings for the unpleasant period and its preceding pleasant period.

4. Induced unpleasant ideas were associated with an increase in sighing respirations in both groups of patients and in the control subjects. These changes were significant for patients of Group I and for the control subjects.

5. Induced unpleasant ideas were associated with significant increases in patients of Group I in upper minor fluctuations, upper major fluctuations, points off the upper line, and lower minor fluctuations.

6. No significant changes were found during the unpleasant period in any of the items for Group II patients and for the control subjects.

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THE ELECTROSHOCK CONVULSION SYNDROME[1]

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Convulsions induced by electrical stimulation of the head follow a fairly constant pattern on repetition and in different patients. A few variations occur. The most usual pattern following stimulation with unidirectional currents to the "vertex positive—left temple negative" position as described by Friedman and Wilcox(3), consists of five phases:

1. The tonic phase begins with dilatation of the pupils and the turning of the eyes upward when the dose reaches the convulsive threshold. This phase continues with the eyes up, the head back, and the shoulders tensed in flexion. The arms are lifted with the elbows extended, the forearms pronated and the fingers and wrists flexed. The thighs are partially flexed, the knees extended, the ankles and feet bent downward with some pronation. Every muscle of the body is under tension. The muscles of the face are tense and the jaw is usually held open to some extent.

2. The clonic phase begins with slight quick repeated momentary relaxations of the tonic muscles and the jaw is usually closed strongly. The jerks gradually develop into alternating relaxations and contractions of increasing amplitude and decreasing frequency, involving all the extremities and trunk muscles symmetrically. The underlying general tonus becomes less. The duration is usually from 30 to 45 seconds. Towards the end of this phase the clonic contractions become less frequent and, though still of large amplitude, less vigorous. Some degree of cyanosis usually becomes apparent near the end of the clonic phase.

3. The atonic phase usually lasts only a few seconds or is even absent between the cessation of the clonic movements and the reestablishment of respiration. In occasional cases this phase is prolonged and artificial respiration is indicated. Cyanosis usually occurs and deepens if this phase is prolonged.

4. The stuporous phase begins when respiration is definitely reestablished and ends when complete consciousness is restored. The duration is 5 minutes to 30 minutes. The cyanosis clears away quite rapidly. There is hypernea plus varying degrees of intermittent generalized tonus. In some cases there is a brief period of asymmetrical irregular twitchings. Occasional patients cry out and groan and become quite overactive, thrashing around in a diffuse, random, poorly coordinated manner, as their consciousness begins to return.

5. The post-convulsion mental state. Patients show various degrees of full consciousness and integration during the first two or three hours after they have regained consciousness. In the cases treated by our technique retrograde amnesia is almost never noticeable after the patient has cleared of his stuporous-confusional period, although there is often a sense of fatigue and diminished purposefulness (and sometimes a headache) during this period. The variations in the character of this period are extremely great, both in the same patient after different convulsions and in different patients.

The most striking characteristics of this complex phenomenon, to superficial observation, are the clonic contractions and the loss of consciousness. Is this syndrome the result of excitation of brain centers or is it the result of "knocking out" temporarily the higher centers, allowing uninhibited brain stem patterns to appear?

The tonic phase has much in common with the pattern of decerebrate rigidity(11) in man resulting from transection through the mesencephalon. This has led some to describe grand-mal convulsions as decerebrate rigidity which becomes intermittent during the clonic phase. For example, Yakovlev(12) says, "Thus, it appears that the clonic phase of the seizure of grand-mal is merely an epiphenomenon of the tonic phase, the difference being one of continuity of muscular contraction rather than of difference in the level of innervation."

Temple Fay(2) has presented the intriguing hypothesis that the convulsion is a primitive reflex mechanism for flipping an amphibian back into the water. He says, "From an evolutionary standpoint, we must abandon the irritative theory, for one of release[2] of higher levels . . . . although slightly more complex than the tendon reflex response, it nevertheless follows the same release phenomena and therefore might be expected to be precipitated by normal sensory impulses during a period of loss of cerebral control."

[1] Read at the ninety-ninth annual meeting of The American Psychiatric Association, Detroit, Michigan, May 10-13, 1943.

The Reiter Electrostimulator Model CW was used in this work.

[2] Apparently by "release" he means "loss of cerebral control."

Penfield and Erickson(7), developing the irritative theory (pp. 87 and 225), point out the possibility that the tonic pattern could be due "to spontaneous discharge within centers below the midbrain and without any transverse paralysis at a higher level."

However, they also state (p. 85), "clonic seizures, in general, point to the cerebral cortex," and (p. 62), "a generalized seizure (major convulsion, grand-mal) is characterized by involuntary tonic or clonic contractions of the muscles of both sides of the body with loss of consciousness. It results from epileptic discharge in both sides of the brain but not necessarily in all parts of the brain."

It is the purpose of this paper to bring together certain observations which support the contention that the electroshock convulsion syndrome is primarily the result of integrated activity of the motor cortex. It may be noted in passing that electroshock convulsions have a much more standard pattern than grand-mal attacks of cryptogenic (idiopathic) epilepsy.

The most striking characteristic of the tonic phase, as seen in electroshock convulsions, is the universality of the muscular contraction. If we assume for the moment that the whole motor cortex, bilaterally, is simultaneously excited, what would be the resultant posture? It would be a posture in which the stronger muscles dominated, modified by the area of representation in the motor cortex. Penfield and Boldrey (reproduced in Penfield and Erickson, p. 48)(7) drew an interesting gargoyle representing man's proportions according to the area of representation in the motor cortex of the various body areas. The hands, feet and mouth are large. In the tonic pattern the hands and feet seem to lead the position of the extremities. Flexion of the fingers and pronation of the hands are stronger than the opposite motions. An exaggeration of pronation brings the shoulders forward with the help of the pectoral muscles. Plantar flexion of the foot and ankles is stronger than the opposite. Although we commonly think of the gluteus maximus as the strongest muscle in the body, the forward kick of the thigh is much more vigorous. Thus the legs will be partially flexed at the hips, extended at the knees and plantar flexed at the feet. Since the pull on the great toe side is the stronger the legs will also be pronated. The position of the neck will be hyperextended because of the greater strength of those muscles. In this way the head is pulled back without producing actual opisthotonos. The position of the muscles of the face and jaw assume an intermediate position and later the masseters close the jaw tightly during the clonic phase. The status of the eyes is less clear, but the normal associated movement of the eyes with lifting the head is up. Likewise on looking up, one normally accommodates to distance so that the pupils dilate. The respiratory muscles come to an intermediate standstill because of countertensions, but the heart is relatively less affected because its main control is through the autonomic centers.

Voiding, soiling and vomiting are uncommon. They occur in that order of frequency and in that order of time *after* the clonic phase is over. Vomiting is the least common and only develops when the recovery phase is nearly completed.

Friedman and Wilcox(3) explored the effectiveness of many positions of the electrodes with their unidirectional currents and found that the least current was needed to produce a convulsion when the stimulus was applied along the motor cortex. The difference between the two sides of the brain was not very marked. This localization indicated that probably the motor cortex itself could be considered the "trigger zone" for the convulsion. The convulsion is symmetrical no matter which side is stimulated, thus suggesting that the excitation spreads immediately to the opposite side when the convulsive threshold is reached.

This localization suggested a primary pyramidal tract syndrome. However, the amount of motor response to a stimulus below the convulsive threshold has no correlation with the convulsive dose. Some patients with a very small motor response to the subconvulsive stimuli have a low convulsive threshold. Just the opposite often happens, namely, some patients with strong large motor response to the subconvulsive stimuli have a low convulsive threshold and some a high threshold. All intermediate combinations have been observed. These observations sug-

gest that the "trigger zone" response is not dependent upon the degree of peripheral motor response to local stimulation of the motor cortex.

A patient was treated who had a pyramidal tract lesion affecting the right leg alone. The cause of this condition was not known. It was of several years' duration and not progressive. Partial voluntary control was preserved but there were mild spasticity, hyperactive knee and Achilles jerks and positive Babinski on that side. During several electroshock convulsions the contractions of the right leg were markedly less than those of the left leg. This suggested that the pyramidal tracts are essential to the convulsion motor syndrome.

Another patient was treated who presented all the classical signs of advanced postencephalitis. She also had oculogyric crises and spells of paradoxical hyperkinesia. Her symptoms were inadequately controlled by 8 mg. of rabellon [3] daily divided in four doses. Her response to electroshock stimulation was completely typical of the average non-neurological case. The several phases of the syndrome were typical in duration and character. Her respiratory and cardiac responses were good. During the stuporous stage there was no extrapyramidal rigidity. This case demonstrated quite clearly that the typical syndrome does not depend on the extrapyramidal system being intact.

During the tonic and clonic phases patients do not vomit, do not move their bowels, do not empty their bladders and do not have symptoms of uterine contraction. The treatments have been given shortly after meals and during active menstruation. If the bladder is full patients often void during the atonic phase, especially the women. Occasionally there is defecation during the stuporous stage but this only occurs when the bowels are loose or the rectum is overfilled. No effect on menstrual flow or show of blood has been noted in any case. These observations indicated that the action on smooth muscle was absent or was at least inhibitory during the tonic and clonic phases.

It is difficult to palpate the pulse during the clonic phase but the pulse is always temporarily slowed during the atonic phase with progressive return to normal rate early in the stuporous stage. To study the action of the heart and diaphragm during the tonic and clonic phases some patients were given convulsions while under the fluoroscope. The diaphragm became fixed in a position of partial expiration at the onset of the tonic phase. No perceptible movement of the diaphragm occurred during the tonic and clonic phases but small movements began in the atonic phase and large movements in the early stuporous stage. During the clonic phase, the entire chest was jerking so that there could easily be some lung movements even though the diaphragm seemed fixed.

During the tonic phase the heart rate was not much affected but towards the latter half of the clonic phase a marked slowing occurred. There were occasional extrasystoles. When the heart was slowed it was held in contraction between beats so that the beats were intermittent relaxations. During the atonic phase the heart remained slow and during the early stuporous phase it was seen to return to normal rhythm in two or three minutes. There is some variation in the degree and in the duration of this slowing and not enough patients have been observed under the fluoroscope to establish the limits of variation.

The syndrome of medullary stimulation is commonly stated as the slowing of the heart with increased respiration. The syndrome of medullary paralysis is the acceleration of the heart with respiratory paralysis. Neither of these combinations occurs during any phase of the electroshock convulsion. During the tonic phase there is respiratory standstill without significant change in heart action. During the latter part of the clonic phase the heart is slowed while there continues to be respiratory standstill.

During the atonic and stuporous stages the respiratory recovery progresses at least as rapidly as the return of the heart rate to normal. To this can be added the observation that the large doses of rabellon in the postencephalitis case did not affect the convulsion syndrome. Furthermore, there was one case of an elderly man who had auricular fibrillation of fairly long duration with minimal signs of decompensation who received

[3] Sharp & Dohme preparation of the alkaloids of belladonna.

convulsion treatment for his depression. He seemed a poor risk, but after digitalization he was given a series of electroshock convulsions. The syndrome followed the average pattern except that during the atonic phase his pulse was slowed less than the average.

These observations suggest that the respiratory center and the vagus centers in the medulla receive complex sequences of stimulation from the higher centers but that the resulting medullary activity is not an essential part of the convulsion syndrome. They do not suggest that the medullary centers have been released from higher inhibitory control as would be the case in decerebrate rigidity.

A patient was given a barium meal and then the stomach was observed during the course of an electroshock convulsion. The normal movements of the stomach are relatively slow and it is uncertain just how soon they stopped, but it was soon apparent that the stomach movements had ceased and they had not recommenced after five minutes of the stuporous period. The cessation of movement was in the usual resting phase. The barium was collected in the fundus while the patient was supine. Practically no barium was visible in the lower half of the stomach and the duodenal bulb remained well filled. This inactivity accounts for the lack of gastrointestinal symptoms.

Further evidence that the "trigger zone" is an area of integrated nerve activity rather than an area of cortical paralysis is found in the nature of the convulsive threshold dose. Threshold stimulation of neuromuscular mechanisms follows the well known strength-duration curve(5) from which Lapicque(6) derived his chronaxie. In the strength-duration curve there is a current below which infinite prolongation of the duration of the current stimulus fails to elicit a response. The current of long duration that produces a threshold response is called by Lapicque the rheobase. When the strength of current is increased above the rheobase level less duration is required to produce a threshold response. This relationship follows an approximately hyperbolic curve in normal neuromuscular mechanisms.

In the production of convulsions, a repetitive stimulus is used. When enough milliampere seconds are given in a short enough time interval a convulsion occurs. A current which fails to produce a convulsion after ten seconds of duration probably never will produce a convulsion no matter how long it is left on. As the current is increased the duration required rapidly decreases. The milliampere-second dose required becomes much less for small increments above the rheobase but does not change much after the current has been made more than twice the rheobase. If a patient is given a short series of convulsions, three times a week, using different combinations of strength and duration, an approximate strength-duration curve can be constructed.[4]

Thus it can be stated that just as strength-duration curves of threshold stimulation have been demonstrated for isolated cortical motor areas(9), there is a strength-duration curve of threshold stimulation for the complex integrative electroshock convulsion syndrome.

Another type of evidence that the electroshock convulsion is an active integrative syndrome rather than the "knocking out" of higher centers comes from the field of anticonvulsant drugs. Intravenous sodium amytal can be used to interrupt status epilepticus. Intravenous sodium amytal has also been particularly useful as an aid in interviewing(10) catatonic patients. The drug is given slowly and as the patient becomes a little drowsy he can be aroused to answer questions, calculate and recall, none of which he may have been able or willing to do while in catatonic stupor. This release of a considerable portion of the patient's psyche by sodium amytal indicates that its primary action is on the highest integrative and inhibitory levels.

Two catatonic patients were brought into this facilitation state with intravenous sodium amytal and then given an electro-

[4] Dr. W. T. Liberson informs me that Lapicque's conception of the chronaxie of an excitability reacting to iterative stimulation requires a more complex elaboration of the experimental data. The frequency number and the duration of the individual stimuli have to be considered as well as the rheobase. However, the summated threshold milliampere-seconds in our procedure does conform to an approximate hyperbolic strength-duration curve.

shock convulsion. The characteristic changes were that the threshold convulsive dose was considerably increased, the clonic phase was shortened to only a few jerks and there was no stuporous phase. Both patients were immediately accessible after the clonic phase just as they had been just before the stimulus. A larger series was tried with sodium amytal by mouth. While the results were highly variable because of the various levels of sedative effect at the time of stimulus, some of the cases did follow the same convulsive pattern as did the two in response to sodium amytal administered intravenously. This suggests that sodium amytal inhibits the "trigger zone" so that it requires more current to set it off and its excitation quickly subsides, thus not disturbing consciousness in the postclonic phase.

A large number of conditions may cause convulsions. If we assume that the "trigger zone" for convulsions is fairly definitely localized, then any excess of excitation that overflows from any other area may be sufficient to set off the convulsion syndrome. The source of the cerebral dysrhythmia as revealed by the electroencephalogram in cryptogenic (idiopathic) epilepsy is variable, sometimes being remote from the motor cortex. Possibly epilepsy occurs more often when there is paroxysmal cerebral dysrhythmia plus a low threshold in the "trigger zone." The absence of epilepsy in the presence of cerebral dysrhythmia may be due to a high convulsive threshold. This theory can be easily tested by those who have a number of epileptics available and EEG. facilities. Neither of these is at present available to the writer. The threshold convulsive dose varies from one person to the next to a remarkable extent. Patients with the highest threshold require nearly 10 times the dose required by patients with the lowest threshold.[5]

The loss of consciousness during the convulsion has given strength to the theory that the higher centers are "knocked out." The nature of consciousness is poorly understood but a possible theory is that it depends on a certain minimal over-all integration of the various areas of the brain. If one area of the cortex suddenly develops a complex excitation syndrome this may interfere with the minimal over-all integration for the maintenance of consciousness. Accordingly the loss of consciousness need not be due either to the "knocking out" of any areas or even to the fatigue of any areas, but may be merely due to the imbalance of cortical excitation.[6]

[5] This difference is not so great when the current is increased to where the convulsion can be obtained from about one second of duration of the summated stimulus.

Summary

The evidence that the electroshock convulsion syndrome is the result of integrated activity of a cortical area near the fissure of Rolando and is essentially a pyramidal tract syndrome can be summarized as follows:

1. Electrical shocks given near the fissure of Rolando are the most efficient in producing convulsions.
2. The tonic pattern looks like the result of generalized excitation of the motor cortex.
3. Pyramidal tract impairment modifies the convulsive pattern.
4. Extrapyramidal tract disease does not modify the convulsive pattern.
5. Autonomic excitation appears to be a secondary phenomenon.
6. No simple medullary syndrome occurs. The medulla seems to be responding differentially to stimulation from above.
7. The "trigger zone" of the electroshock convulsion syndrome responds to various strengths and durations of iterative stimuli with summation to the threshold convulsive dose typical of a strength-duration curve.
8. Anticonvulsant drugs such as sodium amytal act primarily on the higher cortical levels of integration. They also increase the convulsive threshold. Therefore, the "trigger zone" is probably at a fairly high level of cortical integration.

It is further suggested that the "trigger zone" plays a central rôle in all convulsions,

[6] During the tonic and the clonic phases the loss of consciousness seems to be due to imbalance of cortical excitation, but during the atonic and stuporous phases the loss of consciousness seems to be due to lowered excitation resulting from the fatigue of those neurones which were most active during the tonic and the clonic phases. This latter situation is closely analogous to the refractory period following excitation of single nerves.

epilepsy arising when there is an overflow of excess excitation from some other area to the "trigger zone" of the convulsive syndrome. The complex character of the convulsive patterns in epilepsy may result from the modifying influence of the cerebral dysrhythmias. Loss of consciousness may be due to interference with the normal integrative balance of the cortex, rather than due to the "knocking out" of any centers.

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THE MECHANISM OF THE INSULIN EFFECT ON ABNORMAL BEHAVIOR

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The therapeutic rationale of the effects of insulin treatment and other forms of so-called shock therapy of psychotic and psychoneurotic conditions remains to be worked out. One of the early students of the problem, M. Muller(7) wrote: "Neither the endocrine phase of the treatment nor brain pathology, nor the question of convulsions, nor the soothing quieting effect, nor failing consciousness, nor the potent psychic shock . . . . is alone sufficient to solve our problems." In a certain number of individuals the remission of symptoms has persisted for a sufficient length of time to be regarded as lasting. The resultant effects have aroused speculation concerning the actual mode of the therapeutic action of the treatment. We shall not attempt to list all the views that have been offered in explanation. None of the hypotheses presented has been subjected to any experimental test of validity, probably because of the vagueness of these hypotheses.

Sakel(9) thought that adrenal hyperactivity produced a lowering of neural thresholds in the cerebrum, reviving the phylogenetically oldest and infantile constellations and pathways among the neurones. Insulin as the antagonist of adrenalin neutralizes its effect and reverses the whole process. Against this is the fact that there is no evidence of adrenalin overproduction or excess in schizophrenics, in fact, quite the contrary, insulin brings out more adrenalin in the latter hypoglycemic phases of the treatment. George(3) suggested that there is a decrease of permeability of the neuronal membranes, facilitating the retention of toxic products, which is then overcome by the insulin effects. Demole(1) presented a similar hypothesis, assuming that a disturbance of neuronal oxidation results in an accumulation of suboxidized products of metabolism which produce the schizophrenic symptoms as a form of cerebral toxemia. Freudenberg(2) reviewing the various hypotheses of the mechanism of the cure, suggested a combination of the Georgi and Demole theories, but without any new substantial support for them.

The work of Himwich and others(4) has demonstrated that the insulin effect produces a cerebral anoxia in the sense of an interference with the oxygen consumption of the brain, which might be described as a dysoxia, or dysoxidation. The therapeutic effect is undoubtedly associated with the depth of the anoxic or dysoxic effect and is probably dependent upon it. Loman(6) showed that this was due to a lowering of the cerebral metabolism. Alpha waves of the electroencephalogram disappear in hypoglycemia and reappear after administration of glucose. At the same time, Katzenellenbogen(5) shows that delta waves increase.

The question arises as to how the cerebral anoxia or rather dysoxia, acts upon the symptom complexes of the psychotics and in what way it favors a return to normal behavior. It occurred to one of us that the psychopathological symptoms might be regarded as more recently formed habits of response as contrasted with the older drives and habit formations learned in the prepsychotic period of development. Such more recently formed habits could be visualized as mediated by metabolically younger and more unstable synaptic patterns of associated neurones. Such neuronal formations, in virtue of their recency, would be more unstable and more susceptible to break-up by metabolic shock. The corresponding more recently formed habit systems would, therefore, be shaken up, as it were, and then completely broken as an effect of the cerebral anoxia or dysoxia. It was decided to test this hypothesis of habit

hierarchy arranged or ranked in terms of age and habit stability by means of the techniques employed in the study of learning and habit formation in normal animals.

From the preceding discussion it will be seen that the effect of insulin hypoglycemia upon the behavior of the organism is of such complexity as to necessitate analytic examination. The present article covers the second phase of a projected investigation. In a preliminary report(8) the authors presented evidence to show that the effect of insulin injection on learning varies with the age or stability of the habit system involved. The relevant data from this report, hereinafter referred to as Experiment I, are reprinted in Table I.

Two defects in this exploratory investigation are immediately apparent. In the first place, there was no evidence that the observed variations in behavior were the results of the insulin effect rather than of the operational technique itself. Moreover, the relationship between complexity of the habit and the stability of the task was not considered. Among other factors which suggest themselves for study are variations in the nature of the learning problem itself and in the stage of learning at which medication is introduced. It was felt necessary, therefore, to fractionate the experimental procedure so as to obtain evidence on some of the above mentioned questions. This report covers experimentation on four distinct problems.

A. Learning Apparatus and Procedure

The learning situations selected for this phase of the project consisted of variations of a maze test. This was a simple, linear arrangement of the Warner-Warden multiple-unit, metal tunnel maze(10).

Two types of procedures were used in various sections of the experiment. In one, the animals were divided into two groups, both of which were treated identically until they had reached a previously determined norm of mastery. Upon attainment of the criterion, insulin was administered to one group and control medication to the other. Following a period of recovery, both groups were run again for a limited number of trials. Comparisons were thus possible for the periods immediately prior and subsequent to the introduction of the experimental variable.

In the other procedure, the groups were divided and immediately exposed to the control and experimental medication. Following the recovery period, the animals of both groups were introduced into the learning situation and treated identically for the rest of the experiment. Comparisons under this procedure were in terms of trials, errors and time to learn.

In all experiments hunger was used as the motivating organic condition and whole-wheat bread soaked in milk furnished the incentive. Regular feeding with one pellet of Purina Dog Chow per animal followed laboratory routine. Previous work in the laboratory had shown the adequacy of this diet and incentive condition. Observation of the behavior of the insulin and control animals did not indicate any differential drive toward the incentive food on the part of the medicated animals.

All rats used during the experiment were males of a commercial stock. Training was begun during the 60th day after birth. The laboratory was kept at a constant temperature of 70 degrees Fahrenheit. Previous observation had indicated external temperature as one of the variables in the production of the insulin effect and standardization was, therefore, necessary. No food was given to the animals in either control or experimental groups for the 24-hour period preceding medication since the insulin effect is partially a function of the metabolic condition of the organism.

B. Dosage and Medication Procedure

Although the exploratory standardization of insulin dosage in Experiment I had resulted in the establishment of one unit of insulin per twelve grams of body weight as satisfactory, subsequent study indicated the desirability of a smaller and yet effective dose. The use of the larger amount resulted in high mortality rates and in the necessity for repeated glucose injection following insulin convulsions. After repeated exploration, it was found that the optimum dose could be reduced to one unit of insulin per 20 grams of body weight. This dosage was used in all of the experiments reported in the

present paper. It is understood that the amount of insulin injected is related to the specific stock of rats and to the temperature and feeding conditions of the laboratory.

The dose reported above was effective in causing either deep lethargy or convulsive seizures in all animals treated. Mortality was approximately 15 per cent for the total number of subjects used in all experiments. The first gross changes in behavior following injection were visible after an average latent period of 27 minutes. Deep lethargy accompanied by flexibility and non-resistance to handling appeared with an average latency of 43 minutes. The latent period of convulsive seizures was 46 minutes. These latter phenomena occurred in 55 per cent of the cases. As reported in our first paper, movements of the head region were particularly pronounced with frequent spasmodic squeals, rotation of the fore-quarters and gnashing of the teeth. Glucose injection was made part of the routine treatment of all animals immediately upon the appearance of either the deep lethargic or convulsive states. The solution used was 2 c. c. of 10 per cent glucose, administered subcutaneously in the left hind leg. The insulin was likewise subcutaneously given, but in the other hind limb. Cessation of lethargy or convulsion after glucose injection was almost immediate in most animals. Following recovery, each rat was given a pellet of food and adequate water and allowed to remain undisturbed for 12 hours. At this time, training was begun again.

C. Results of Specific Experiments

Experiment I.—This will be described and discussed only briefly here since it was published in full elsewhere(8).

Table I shows the mean scores in total errors of a group of 12 rats who were trained in rotation on two mazes. One-half of the group was started on an elevated T maze, the other on a tunnel maze, the Warner-Warden type. After attainment of a norm of mastery of 9 out of 10 perfect trials on the first maze, the animals were given 120 over-learning trials and then started on the second instrument. When the latter had been learned to the same norm, but with only 20 practice trials beyond the criterion, insulin was administered. Comparisons are in terms of the mean errors during the last 20 trials before and after injection of the insulin. For half the group, the elevated maze was the oldest habit and for the rest, the alley maze. It is clear from the column of t and P values that there are significant differences at the 0.075 and 0.01 levels for comparisons between the post-shock scores in the old and the new habits for the elevated maze and the tunnel maze, respectively. Since the t and P values for the pre-shock scores are the 0.7 to 0.9 level, there are no significant changes during the pre-injection period. It seems safe, then, to conclude that both on the elevated and in the tunnel maze the injection of insulin is accompanied by more severe impairment of the newer or less well established habit.

TABLE I

Effect of Insulin Injection on the Learning of Two Mazes of Different Degrees of Stability to the Same Criterion of Mastery

Groups compared	N	Means	Diffs.	t	P
Pre-injection					
Elevated; older	6	0.33	0.17	0.134	0.8 to 0.9
Elevated; newer	6	0.50	...	....	....
Tunnel; older	6	0.83	0.33	0.275	0.7 to 0.8
Tunnel; newer	6	0.50	...	....	....
Post-injection					
Elevated; older	6	6.00	5.00	2.220	0.05 to 0.1
Elevated; newer	6	11.00	...	....	....
Tunnel; older	6	4.83	10.50	4.200	less than 0.001
Tunnel; newer	6	15.33	...	....	....

Entries under column of Means represent total errors during 20 trials, either before or after criterion runs for the newer habit or before, and after 200 post-criterion trials for the older habit.

Experiment II.—In this experiment a simple problem was learned to two different criteria of mastery. The Warner-Warden maze was arranged so that it presented a linear pattern with two blind alleys and two true-pathway elements. Nine rats were run through this maze until they had succeeded in scoring 9 out of 10 errorless trials. The other group of nine were handled in similar fashion, but were stopped when they had performed without error on 3 of 4 consecutive trials. Upon the attainment of the norm in each individual case, insulin was injected and, after a recovery period, 10 additional trials were run. Comparisons are in terms of mean errors per trial for the 10 pre- and post-injection runs. These means were then averaged for the whole group in each section.

Experiment III.—The findings of the first two experiments established the differential effect of the insulin injection on habits overlearned to various degrees and on habits learned to different criteria of mastery. However, in both investigations, the tasks were of considerable complexity. Experiment III was set up to determine whether the differential effect would persist in habits of varying complexity, but equivalent age or stability. Groups of animals were, therefore, trained on two mazes differing in the number of blind-alleys but alike in pattern and in the norm of mastery required for completion of the task. The Warner-Warden Tunnel maze was used in a 2- and 5-blind alley arrangement. The rats, divided into groups of 12, were run until they scored 9 errorless trials in a sequence of 10 attempts. Following this, the subjects in each group were injected with insulin and, after recovery, were run again for 10 trials. Comparisons are made between the average errors per trial on the 10 trials before and after injection, for each maze group.

TABLE II

EFFECT OF INSULIN INJECTIONS ON A SIMPLE TWO-BLIND ALLEY MAZE LEARNED TO TWO DIFFERENT CRITERIA OF MASTERY

Groups compared	N	Means	Diffs.	*t*	*P*
3- 4; pre-injection	9	1.52	0.17	0.362	0.7 to 0.8
9-10; pre-injection	9	1.35	...	....	....
3- 4; post-injection	9	2.58	2.30	3.898	0.001 to 0.01
9-10; post-injection	9	0.28	...	....	....
3- 4; pre-injection	9	1.52	1.06	1.656	0.1 to 0.2
3- 4; post-injection	9	2.58	...	....	....
9-10; pre-injection	9	1.35	1.07	2.815	0.01 to 0.02
9-10; post-injection	9	0.28	...	....	....

Entries under column of Means represent average errors per trial during the 10 trials, either before or after the criterion trials.

Table II gives the data for this experiment. It will be seen that the mean number of errors per trial for the two groups was approximately the same during the training period; that is, up to the attainment of the norm of mastery. This is indicated in the first pair of comparisons. After injection, the mean errors per trial of the group run to the lower norm are significantly greater than those for the higher criterion group. These data come from the second pair of comparisons. In the third pair, the effect of insulin on the lower criterion group alone is shown. The increase in errors per trial after insulin injection is significant at the 0.1 to 0.2 level. For the more practised group, run to a criteron of 9 out of 10 perfect trials, the effect of insulin was negligible, the mean error scores, in the fourth pairing, showing a tendency to decrease rather than to increase.

The relevant figures are presented in Table III. The first set of comparisons indicates that the 5-blind alley maze is slightly more difficult during the pre-injection runs than the shorter maze. This difference becomes increasingly apparent after insulin injection, as demonstrated in the second pair of rows. Here the significance of the difference is established by the high value of *P*, less than 0.001. The effect of the medication on the pre- and post-injection scores of the group assigned to the shorter maze is shown to be of relatively low significance. The third

set of comparisons must be interpreted as demonstrating that insulin injection has little if any effect on post-injection behavior in the 2-blind alley maze. When this evidence is contrasted to the data presented in the last set of comparisons, it is clear that the insulin produced impairment in the longer, more difficult maze while not affecting the shorter task. The level of significance of the difference between pre- and post-insulin behavior for the more difficult situation is high, with P values between 0.01 and 0.02.

TABLE III

THE EFFECT OF INSULIN ON THE LEARNING OF A TWO BLIND-ALLEY MAZE AND A FIVE BLIND-ALLEY MAZE TO THE SAME NORM OF MASTERY

Groups compared	N	Means	Diffs.	t	P
2 B.A.; pre-injection	9	2.22	0.88	2.00	0.05 to 0.1
5 B.A.; pre-injection	9	3.10	...	...	....
2 B.A.; post-injection	9	0.54	4.36	7.03	less than 0.001
5 B.A.; post-injection	9	4.90	...	...	....
2 B.A.; pre-injection	9	2.22	1.68	1.71	0.1 to 0.2
2 B.A.; post-injection	9	0.54	...	...	....
5 B.A.; pre-injection	9	3.10	1.80	2.58	0.01 to 0.02
5 B.A.; post-injection	9	4.90	...	...	....

Entries under column of Means represent average errors per trial during the 10 trials, either before or after the criterion trials.

Experiment IV.—The purpose of this section of the project was to eliminate the possibility that the impairment, previously described as resulting from insulin injection, could have been produced by the operative shock of the injection itself rather than by the physiological effect of the insulin. One group of 12 rats was injected with a normal saline solution in the same volumetric relationship to weight as the insulin dosage. The other group was treated with insulin. Both injections were administered after a 6-blind alley tunnel maze had been learned to a criterion of 9 out of 10 errorless trials. Following the recovery period, each animal was run for 10 trials.

The data from this experiment are presented in Table IV. The first set of comparisons indicates a slight and insignificant superiority of the insulin group on the 10 trials prior to the criterion runs before the injection over the group to be injected with saline solution. This difference is markedly reversed when post-injection scores are compared. The level of significance of the difference establishes insulin as far more detrimental to learning than saline solution. The third set of comparisons indicates that the injection of saline solution has no effect on subsequent behavior, whereas insulin increases the number of errors to a highly significant level as shown in the last set of comparisons.

TABLE IV

EFFECT OF SALINE AND INSULIN INJECTIONS ON THE LEARNING OF A SIX BLIND-ALLEY MAZE TO A CRITERION OF 9 OUT OF 10 PERFECT TRIALS

Groups compared	N	Means	Diffs.	t	P
Saline; pre-injection	12	3.00	0.58	0.715	0.5 to 0.6
Insulin; pre-injection	12	2.42	...	....	....
Saline; post-injection	12	0.42	5.33	5.868	less than 0.001
Insulin; post-injection	12	5.75	...	....	....
Saline; pre-injection	12	3.00	2.58	28.432	less than 0.001
Saline; post-injection	12	0.42	...	....	....
Insulin; pre-injection	12	2.42	3.34	4.280	less than 0.001
Insulin; post-injection	12	5.75	...	....	....

Entries in column of Means represent average errors per trial for the 10 trials either before or after the criterion trials.

From this study it is apparent that the operative procedures involved in the injection of a neutral fluid into a rat have little

or no effect on learning behavior following the injection. However, when the injected material is insulin, rather than a neutral saline solution, impairment of habit performance is immediate and significant.

Experiment V.—All the previous experiments demonstrated the effect of insulin injection on behavior after a certain amount of practice had been given to the subjects. The purpose of this study was to determine whether insulin, injected before any learning had taken place, would affect the number of trials necessary to reach a given degree of mastery and the number of errors involved in reaching the criterion. A 6-blind alley, linear arrangement of the Warner-Warden maze was used with a criterion of 9 out of 10 perfect trials. A control group was set up which received no medication.

TABLE V

EFFECT OF NO MEDICATION AND OF INSULIN INJECTION ON THE NUMBER OF TRIALS TO LEARN AND ON THE TOTAL ERRORS INVOLVED IN LEARNING A SIX BLIND-ALLEY MAZE TO CRITERION OF 9 OUT OF 10 PERFECT TRIALS

Groups compared	N	Means	Diffs.	*t*	*P*
Control	12	25.67	8.68	5.388	less than 0.001
Insulin	12	34.33	...	....	....
Entries in column of Means represent total number of trials to learn to the criterion trials.					
Control	12	43.92	19.00	2.159	0.02 to 0.05
Insulin	12	62.92	...	....	....
Entries in column of Means represent total errors in trials to learn to the criterion trials.					

The relevant data are presented in Table V. The effect of the insulin can be clearly seen in the significant increase in the mean number of trials to learn the maze. This increase as a result of insulin anoxia is significant at the remarkably high level of less than 0.001. A comparable tendency is found in the number of errors made during the learning process.

The conclusion again points to the noxious effect of insulin injection upon habit formation. In this study, the effect is seen to persist over the whole course of learning and to operate in such fashion as to retard the entire learning process.

D. SUMMARY AND CONCLUSIONS

1. The effect of insulin injections, sufficient in strength to cause convulsive seizures and/or lethargy, has been systematically studied in relation to various aspects of the learning process.

2. For maze learning the following statements have been experimentally verified and established:

(a) Insulin has a greater disintegrative effect on the learning of a habit which has been less well fixed than on a habit of greater fixation.

(b) Insulin has a greater disintegrative effect on the learning of a longer and more difficult maze than on a shorter and easier maze, when both are learned to the same norm.

(c) Insulin has a disintegrating effect on the initial acquisition of a maze habit when compared to the acquisition of the same habit under normal conditions.

(d) The effects described in the above statement are definitely the result of insulin injection. Comparison of the use of insulin and saline solution proves insulin to have a disintegrative effect which is lacking in the saline situation.

Our work has demonstrated that the insulin effect may be used as a means of testing the relative age and stability of different habits and habit systems. Its employment may be regarded as a kind of "chemical surgery." We are continuing with the work and expect ultimately to apply it to the experimental neurosis which may be produced in the rat, and also to compare it with similar work carried out on human beings. The consistency of the results clearly substantiates our concept as to how the insulin effect operates to bring about a remission in schizophrenia and other psychotic and psychoneurotic conditions. We do not claim that it is

the whole explanation of a lasting cure or complete recovery; as other factors, such as the response of the entire endocrine system, particularly the pituitary and adrenal glands, may also be involved in the final return to the normal. However, our work appears to explain the mechanism by which the immediate remission of the abnormal behavior is brought about.

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ANOREXIA NERVOSA: METABOLISM AND ITS RELATION TO PSYCHOPATHOLOGIC REACTIONS [1]

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The present report may be considered as consisting essentially of two parts: (1) A study of psychopathologic reactions and their relation to somatic changes commonly observed in anorexia nervosa, and (2) investigations of energy metabolism and the absorption and metabolism of food stuffs in an effort to determine whether these somatic changes are the result of a "primary" metabolic disorder or of simple inanition. The subjects were four patients who were resident in The Payne Whitney Psychiatric Clinic.

CLINICAL OBSERVATIONS

CASE I (No. 1727) was a 16-year-old girl who had been overweight since the age of five years. She began to reduce in the summer of 1939, decreasing her food intake in the fall until her weight dropped from 132 to 94 pounds on admission in February 1940. She became preoccupied with diet, was anxious, and constantly moved about busy with pseudoactivities. The clinical picture showed no essential change during the six months in the hospital. After discussion of her orientation to her divorced parents, her preoccupation with sexual urges, and her desire to be a boy she began to show a decrease of tension during her last two months in the hospital, becoming less active and gaining 24 pounds during hospitalization. She gained little insight into the dynamic factors and since discharge has had to be readmitted to a psychiatric hospital where she has shown progressive scattered behavior, impulsiveness, and inadequate emotional responsiveness. This behavior confirms our diagnosis of schizophrenia. Feeding has remained an outstanding problem.

In this patient, whose parents were divorced when she was three years old and who was brought up as an only child, a six-month period of violent temper tantrums occurred at the age of 7. Feeding was no problem in infancy. Menses started at 14 years of age (December 1938) and occurred irregularly and scantily up to the onset of her starving herself, when they ceased.

She was intelligent, highly sensitive, reserved, and socially poorly adjusted. Her family history contained no psychopathological reactions.

CASE II (No. 1938) was a 17-year-old girl who had been overweight since childhood. She began to reduce in the fall of 1939, her weight dropping from 133 to 82 pounds on admission in November 1940. She became mildly depressed, resentful, and preoccupied with fear of eating. The clinical picture changed gradually during her six months in the hospital. She began to enjoy group activities, felt increasingly at ease, and began to eat well. She gained an understanding of her resentment to her mother and other dynamic factors. Her marked, restless overactivity gradually decreased.

This intelligent girl had always been inclined to be moody; she was ambitious in school and reached for high ideals. She had been the unwanted child of a severely psychoneurotic, alcoholic mother and an unsuccessful, retiring father. There were feeding difficulties in infancy. Her menses started at 13 and were regular. They ceased during the present illness.

During the treatment she gained 34 pounds. Obsessive features, although not expressing themselves in the clinical picture, seemed to play a rôle in the setting of mild depression but the outstanding psychopathologic reactions were phobic in nature. The patient has continued to do well. At present she appears only slightly plump.

CASE III (No. 1824) was a 21-year-old unmarried woman who had for a year shown a poor scholastic record in college. During the two months before admission in June 1940 she was depressed, tense, restless, and had marked unreality feelings and a thinking disorder. Her weight dropped from 122 to 93 pounds. She developed obsessive thoughts of hurting herself and her mother. This intelligent patient, who was the third of four children, had always been considered shy, seclusive. She strove for very high goals and was easily discouraged and fearful. Her brothers and sister were successful scholastically and socially, the parents driving and rigid. Her menses started at 15, were irregular, and ceased during her illness.

She improved greatly during her nine months in the hospital, gradually losing her restless overactivity and becoming cheerful and socially well adjusted to the group. Her obsessive thoughts disappeared after eight months and she gained 22 pounds. She was, however, unable to gain a full understanding of the dynamic factors. In the last two years she has continued to be shy, quiet, and reserved but has attended college. Her menses continue to be irregular and she tires easily but otherwise makes a good adjustment. She eats well and

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her weight is average. Her eating habits are not unusual.

In this patient, obsessive features were definitely present but in the setting of a schizophrenic illness.

CASE IV (No. 2153) was a 15-year-old girl who had been concerned about acne and her diet for three years. During the five months before admission in September 1941, she ate little, losing weight (from 120 pounds to 90 pounds), was "confused in her thinking," felt depressed, and heard occasional whispering voices. This intelligent girl had always been highly conscientious, serious minded, quiet and seclusive. An only child, she was greatly protected, dependent on her aggressive father and feeling insecure with her anxious, severely psychoneurotic mother. There had been no feeding difficulties in infancy. When at camp at the ages of 10, 11, and 12, she had been very homesick and lost considerable weight during these periods. Her menses started at 12 and were regular until the onset of her present illness, when they ceased.

During the four weeks in the hospital, she remained depressed, very anxious, seclusive, preoccupied with the food problem, and concerned about her appearance. There was mild restless overactivity. For psychotherapeutic reasons, it was considered unwise to force feeding, and she lost further weight (going from 90 pounds to 80). Her clinical picture was considered essentially schizophrenic. She was averse to continued hospitalization. However, after a short period at home, she was admitted to another psychiatric hospital.

The common feature in all four patients is the refusal to eat which is caused by an aversion to, or fear of eating, food. It was apparently not caused by loss of appetite as all the patients had the desire for food and sometimes even enjoyed daydreams about eating. Various reasons were given for the refusal to eat (fear of developing a large abdomen in Cases I and II, and fear of acne in Case IV), but no specific dynamic factors were recognizable. Frank compulsive features were not present in any of the patients, although several dynamic factors suggested the possibility of their existence.

Overactivity of a restless type, often expressed in pseudoactivity, was very marked in Cases I and II, less so in Cases III and IV. It occurred in the setting of marked anxiety and became less marked with the decrease of this emotion. The outstanding emotional reactions were anxiety and resentment. Alleviation of these emotions were accompanied by gain of weight.

Treatment was made difficult by resentment which became readily directed to the hospital routine. From experience with other patients suffering from anorexia nervosa, it was considered wise to disregard the symptoms as much as possible. A sustained effort was made to alleviate anxiety through organized activity and psychotherapeutic discussions. Hydrotherapy, and especially occupational therapy, were used to diminish the restless overactivity. In the last case (IV), where the loss of weight continued, forced feeding might have been temporarily helpful but this is a debatable point. The results of treatment are encouraging except when anorexia nervosa is in the setting of a schizophrenic illness or frankly compulsive in nature.

METABOLISM

During all periods of observation, the intake of food and the collection of urine and feces were carefully supervised. When the patient was sufficiently cooperative to consume all food offered, the diet was kept constant from day to day. When constant diets could not be used, the calories and protein intake were calculated. The methods employed for the collection of urine and feces were similar to those previously described.[2]

The data on the daily intake of food and on the output of nitrogen and other substances in the urine and feces are shown in Table I. The findings in the four patients can be summarized as follows: The intestinal absorption of protein nitrogen, judged by the amounts of nitrogen in the feces, was normal. Similarly, the absorption of fat was essentially normal although the amounts of fecal fat in Case I were slightly higher than is usually seen in the average normal subject. The retention of nitrogen was similar to that observed in persons without anorexia nervosa; that is, the amounts of nitrogen in the urine and feces approximately equalled those contained in the food when the latter were of fairly normal amounts (from 8 to 13 g.). However, each time the dietary nitrogen was greatly increased from previously low levels, nitrogen was retained for periods of several days. When the nitrogen intake was abnormally low as in Case IV (2.6 g.), a negative nitrogen balance was observed. The per-

[2] Milhorat, A. T. and Toscani, V. Studies in Diseases of Muscle, VIII. Arch. Neurol. and Psychiat., 41, 1130, 1939.

centage of total urinary nitrogen excreted as urea nitrogen was normal, indicating no impairment of the ability to synthesize urea. The amounts of preformed creatinine in the urine appeared to be proportional to the total muscular mass of the subjects. Creatinuria was absent or minimal. In brief, the data furnish no basis for postulating a primary metabolic disorder in these patients.

metabolic rate was of an order seen in persons undernourished as a result of causes other than anorexia nervosa. The data on the basal caloric requirements are based on the oxygen consumption needs of the subjects while at rest in a post-absorptive state. When the body weight was unchanged, the difference between the number of calories in the daily diet and the calories required while

TABLE I

AVERAGE DAILY INTAKE AND OUTPUT

Case No.	Period	Days in period	Diet					Urine				Feces		N Balance
			Cals.	Ch	F	P	N	Total N	Urea N	Creatinine	Creatine	N	F	
				g.	g.	g.	g.	g.	g.	g.	g.	g.	g.	g.
1	I	16	2300	250	110	75	12.0	9.78	9.5	0.940	0	1.38	6.15	+0.84
	II	4	3000	300	160	85	13.6	10.08	9.8	0.950	0	2.12	8.63	+1.4
	III	12	3000	300	165	75	12.0	11.80	11.4	0.960	0	1.2	...	−1.0
2	...	10	1376	...	...	55	8.8	6.43	5.4	0.560	0	1.3	...	+1.1
3	...	6	1580	153	84	53	8.5	6.12	5.2	0.900	0.020	1.19	2.74	+1.19
4	...	7	616	50	40	16	2.56	3.92	3.9	0.589	0	1.22	4.75	−2.58

TABLE II

Patient case No.	Period	Body weight at start of period	B.M.R.	Average daily energy metabolism: Diet	Change in body weight	Nitrogen balance	Estimated change in caloric reserves in body fat	Basal requirements	Estimated energy requirements above basal	Remarks
		Kg.	per cent	cals.	gm.	gm.	cals.*	cals.	cals.†	
1	I	41.5	−19	2300	0	+0.8	0	1090	1210	Activity ++
	II	42.7	−13	3000	+37	+1.4	+333	1090	1577	Activity +++
	III	49.6	−11	3000	0	−1.0	0	1236	1764	Activity ++++
2	...	37.3	−11	1376	−60	+1.1	−540	1061	855	
3	...	48.8	−20	1246	−116	−0.6	−1044	1100	1190	
4	...	38.4	−20	616	−260	−2.6	−2340	1011	1945	

* If in these computations, account is taken of the retention of nitrogen, the values given in the column would be altered slightly as follows (reading from top to bottom): −45, +257, +54, −603, −1012, and −2196.

† The changes discussed in * would slightly alter these values as follows (reading from top to bottom): 1255, 1653, 1734, 1152, 1865.

For practical considerations these small differences can be disregarded.

Table II gives the results of observations on the average daily energy metabolism of the four patients. While changes in body weight over short periods of time can be due to alterations in the water content of the body, it is highly improbable that this factor was of any significance in these investigations, for no change in the state of hydration of the subjects could be demonstrated, and the periods of study extended over several weeks. Therefore changes in body weight can be assumed to have been due to changes in the amounts of body fat. The low basal

the subject was at rest is designated in the table as the "estimated energy requirements above basal," and may be considered as the calories expended in physical activity (*e. g.*, Case I, periods I and III). In these instances, no change in the fat content of the body occurred. However, when the body weight changed, the values given for the "estimated energy requirements above basal" were adjusted by amounts equal to the caloric value of the fat that was either lost from the body or deposited in the caloric reserves and not utilized in muscular activity.

One patient (Case IV) used as much as 260 g. of body fat daily in order to meet high energy requirements while on a diet of insufficient caloric content. In this instance, 2340 calories were removed daily from the caloric reserves of the body.

These data demonstrate the ability of the body to adapt itself to varying metabolic requirements as long as sufficient body fat is available. In this regard, patients with anorexia nervosa appear to differ in no essential manner from normal subjects during states of inanition. The one outstanding difference is the large energy requirement related to the excessive muscular activity coincidental with tension and anxiety.

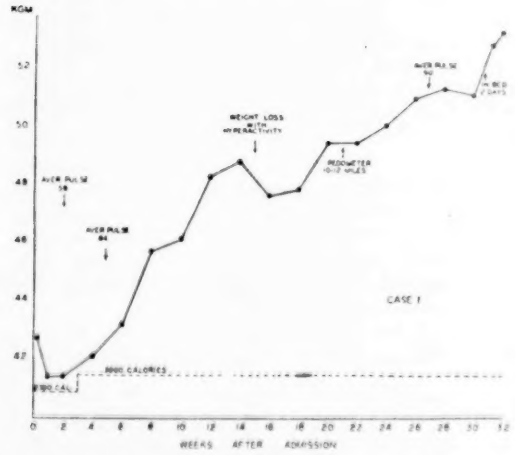

FIG. 1.

Muscular activity which was associated with anxiety often increased the energy requirements to the point where they exceeded the caloric intake although the diets taken at the time would have been adequate for normally active subjects. One patient (Case I), while on a diet of 3000 calories, lost weight for short periods because of hyperactivity (Fig. 1). Thus, while no actual anorexia existed, body fat was utilized to provide extra energy resulting in weight loss. During one period of a week when activity was limited and the patient was confined to bed for two days, she gained almost 4½ pounds although the diet was unchanged. Increasing the basal metabolic rate from −27 to −9 in another patient (Case III) by the administration of thyroid substance caused a further loss of weight. Increases in body weight usually were followed by increases in basal metabolic rates but in none of the patients was the metabolism raised to a normal level.

The effect of ingested glucose on the blood sugar was studied in three patients. In two of the subjects the blood sugar curves were essentially normal; in another subject (Case III) the blood sugar concentration remained at relatively high levels for more than three hours after the ingestion of glucose when the test was performed during periods when the patient showed considerable anxiety, whereas the glucose tolerance curves were normal when the patient was quiet. The effects of emotional factors on the utilization of ingested glucose have already been discussed by Diethelm.[3]

Some authors have observed only slight increases in blood sugar when glucose was given in anorexia nervosa. A study of the published data suggests that this type of glucose tolerance curve was the result of previous diets of relatively high carbohydrate content. From the evidence available at present, it appears that the absorption and utilization of ingested glucose in anorexia nervosa is determined by the quantity and composition of the previous diet and by the presence or absence of emotions such as anxiety and resentment.

The bradycardia commonly described as an integral part of the syndrome of anorexia nervosa and usually considered as being the result of inanition was observed in all our patients. When increases in body weight occurred and anxiety increased the average pulse rate was higher but often showed marked variability resembling that seen in anxious patients.

In one patient the effects of emotional factors were well demonstrated. At the time the patient was admitted and displayed resentment and aversion at being placed in the hospital against her wishes, the average pulse rate was 90 per minute although emaciation was considerable. After a few days when she began to accept the inevitability of the hospital situation and lost her resentment, the pulse rate decreased to around 50

[3] Diethelm, O. Influence of Emotions on Dextrose Tolerance. Arch. Neurol. and Psychiat., 36, 342, 1936.

per minute, but often rose to 80 whenever she became anxious about an impending meal. After being in the hospital for four weeks, she vigorously insisted that her father take her home. She displayed marked anxiety and resentment while awaiting her parent's decision and during this period of three days the average pulse rate was 100 per minute, although the body weight was less than during the period when bradycardia had been present.

Moderate muscular activity, such as walking, induced considerable fluctuations in the pulse rate in all four subjects. The elevation in rate frequently was greater than could be explained by the increase in metabolism resulting from physical effort and exceeded that seen in normal subjects performing the same amount of work. It appears that emotional factors play an important rôle in the instability of the pulse record during mild effort.

Summary

In four patients with anorexia nervosa, investigations were made on (a) the relation of the psychopathologic reactions to the somatic changes, and (b) the energy metabolism and the absorption and metabolism of food stuffs.

Weight changes were found to be the resultant of the caloric intake and energy output which were influenced considerably by anxiety and resentment. Anxiety was manifested physiologically by a change from a slow pulse to tachycardia, increased hyperkinesis, and decrease in glucose tolerance without characteristic changes in appetite.

Observations on the metabolism of various dietary constituents gave no evidence of a "primary" metabolic disorder. The balance of energy changes was similar to that seen in inanition. During most periods the intake of calories was abnormally low, but even with a diet which would have been adequate for the average normal person weight could be lost because of muscular overactivity induced by anxiety. Thus, most of the symptoms of anorexia nervosa can persist without there being an actual anorexia.

THE INCIDENCE OF NOCTURNAL ENURESIS AFTER AGE FIVE[1]

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The complaint of "weak kidneys" in children is one of the commonest which the general practitioner is called upon to treat. Not only is nocturnal enuresis generally refractory to known methods of treatment but it persists into adult life in a much higher percentage of cases than is commonly recognized. Pathological studies have consistently failed to demonstrate urinary tract disease and urinalysis is usually negative except in a small group of cases with inflammatory disease. Kanner(1) lists the following physical and mental conditions which have been suggested as ætiological agents producing nocturnal enuresis:

Anomalies of internal urinary organs.
External irritations:
  Phimosis or adherent prepuce.
  Balanitis, vulvitis.
  Eczema, pruritus.
Subacute or chronic inflammatory disease:
  Cystitis, pyelitis, nephritis.
  Oxyuris vermicularis.
  Highly acid urine.
Psychiatric disorders:
  Epileptic equivalents.
  Hysterical manifestations.
  Emotional instability and immaturity.
  Mental deficiency and constitutional inferiority.
  Poor habit training, indifference and carelessness.
  Thyroid dysfunction.
  Myelodysplasia.
  Spina bifida occulta.
  Nutritional factors:
    High salt and fluid diets.
  Hypertrophied tonsils and adenoids.
  Neurogenic vesical dysfunction:
    Reflex irritations.
  Excessively deep sleep.

Hutchinson(2) describes a nocturnal polyuria with reversal of the relative day and night amounts of secretion, and also believes the condition to be more common in maladjusted children. Brown(3) feels that enuresis may be an allergic phenomenon in some cases thus explaining the observed beneficial effects of ephedrine. Michaels and Goodman(4) report that persistence of enuresis after age 10 was significantly more frequent in psychotic patients than in so-called normal children. Weiss(5) found the condition more common in families with 3 or more children, families in poor circumstances, and children of lower intelligence. Frary(6) presents biometric evidence that nocturnal enuresis is an hereditary trait determined by a single recessive gene substitution and feels that it should be sympathetically treated as an hereditary handicap and not as a conduct disorder for which parents or child are responsible. The postulation of such a large number of possible ætiological factors none of which has been definitely proved indicates the confused state of knowledge concerning the condition and explains the failures in treatment.

Interest in the problem of adult nocturnal enuresis was aroused by the high incidence of this complaint in drafted selectees examined at the Army Induction Station, Third Recruiting District, Rutland, Vt., from November 1940 to date. From February 16 to March 24, 1943, 1000 consecutive selectees were intensively questioned concerning the age and circumstances at which they stopped wetting the bed. Each man was asked: "Do you urinate in the bed at night? How old were you when you stopped wetting the bed? Did you ever see a doctor about it? Was any cause ever discovered for this habit?" A man was arbitrarily rated as having nocturnal enuresis if the act occurred regularly one or more times weekly. Cases in which the habit ceased before age 5 or in which the man could not positively remember the approximate age of gaining bladder control were considered as normal. Table 1 presents the frequency distribution of selectees admitting nocturnal enuresis from ages 5 to 33; it is seen that 16.1 per cent of the thousand men wet their beds after age 5 with some cases failing to get control up to age 33.

In evaluating Table 1 it is necessary to consider the sample of men from which these results were obtained. During the period from February 16 to March 24, 1943

[1] Approved for publication by the War Department Manuscript Board, which assumes no responsibility for statements or opinions herein expressed.

the selectees were largely in the 18 and 19 year age groups with a smaller number of reclassified older men and men with collateral dependents. The distribution may therefore be considered to represent a normal sample of 18 and 19 year old men but is not representative of older age groups in which a large number of selective factors were operative. The older age groups contain a large number of atypical men who did not marry or engage in vital defense occupations because of physical or mental handicaps. The results are statistically significant only in so far as they indicate the incidence of nocturnal enuresis after age 5 to be much commoner than generally recognized, and it might have been even higher if a more adequate sampling of the older age groups had been available. It should also be noted that many cases of enuresis above age 33 would undoubtedly have been discovered if the sample had included more men in the older age groups. It is possible that nocturnal enuresis is higher in Vermont than in other localities since the rejection rates for all types of defects in World Wars I and II is higher for Vermont than the national average.

The lack of adequate case histories and the short period of time available for the neuro-psychiatric examination at the induction station made it impossible to investigate thoroughly the causes of enuresis in each case. Table 2 presents the possible ætiological factors in the group of 161 men reporting nocturnal enuresis after age 5 where enough evidence was available to make a tentative diagnosis. The cases diagnosed as constitutionally inadequate included men who were mentally and physically inferior but not mentally defective, mild psychopathic personalities, and a group with unusual or bizarre personality deviations who were classified as unsuited for military service. The psychiatric diagnoses were made at the induction station; other diagnoses were made either on the history given by the selectee or physical findings verified at the induction station. In 96 cases no

TABLE 1

SHOWING THE CHRONOLOGICAL AGES AT WHICH NOCTURNAL ENURESIS STOPPED IN A GROUP OF 1,000 SELECTEES EXAMINED AT AN ARMY INDUCTION STATION.

Age at which bed-wetting stopped	No. of cases
Unknown or less than 5 years of age	839
5 years	13
6	19
7	15
8	12
9	3
10	14
11	10
12	13
13	9
14	8
15	8
16	7
17	5
18	6
19	7
20	2
21	1
22	1
23	0
24	1
25	0
26	1
27	1
28	1
29	0
30	2
31	0
32	1
33	1
	1,000

TABLE 2

SHOWING POSSIBLE ÆTIOLOGICAL FACTORS IN NOCTURNAL ENURESIS IN A GROUP OF 161 SELECTEES REPORTING THIS COMPLAINT AFTER AGE 5

Possible ætiological factors	No. of cases	Per cent
Unknown or undiagnosed	96	59.6
Constitutional inadequacy	18	11.2
Mental deficiency	11	6.8
Extremely deep sleep	8	4.9
Immaturity (physical)	5	3.1
Psychoneurosis	4	2.4
Post-infectional (scarlet fever)	4	2.4
Epilepsy	3	1.8
Alcoholism	2	1.2
Phimosis (circumcision relieved)	2	1.2
Dribbling day and night	2	1.2
c.n.s. syphilis	1	.6
Cretinism	1	.6
Hypospadias	1	.6
Diabetes mellitus	1	.6
Diabetes insipidus (?)	1	.6
Urethral stricture (g.c.)	1	.6

ætiological factor was demonstrated, while in 65 or 40.4 per cent a possible associated factor was recognized.

It is interesting that the psychiatric classifications of constitutional inadequacy, mental deficiency, immaturity, psychoneurosis and epilepsy included 41 or 63 per cent of the cases in which some associated condition was diagnosed and this suggests that nocturnal enuresis is frequently associated with developmental disorders of the central nervous system.

TABLE 3

SHOWING THE RELATIONSHIP BETWEEN THE DEGREE OF MENTAL DEFICIENCY AND THE INCIDENCE OF NOCTURNAL ENURESIS IN 369 MENTALLY DEFECTIVE INMATES OF THE BRANDON STATE SCHOOL, BRANDON, VT.

Clinical classification	No. of cases	No. enuretic	Per cent enuretic
Idiots:			
Boys	31	26	83.8
Girls	23	21	91.3
Total	54	47	87.0
Imbeciles:			
Boys	66	14	21.2
Girls	98	7	7.1
Total	164	21	12.8
Morons:			
Boys	51	4	7.8
Girls	74	1	1.3
Total	125	5	4.0
Borderline:			
Boys	14	3	21.4
Girls	10	0	0.0
Total	24	3	12.5
Totals	369	76	20.6

In order to demonstrate the relation between nocturnal enuresis and mental deficiency, a study was made of bedwetting in 369 inmates of the Brandon State School with results shown in Table 3. Forty-seven or 87 per cent of the group of 54 idiots were enuretic as compared with 12.8 per cent of 164 imbeciles and only 4 per cent of 125 morons. These results are not strictly comparable to the figures in Table 1 because of the strict training and careful attention given to bedwetting at the Brandon State School where children known to be enuretic are roused several times during the night. It is immediately apparent, however, that enuresis decreases with increasing intelligence.

COMMENT

There are several possible interpretations of the fact that nocturnal enuresis has been consistently reported in association with other types of psychological maladjustments. The currently popular theory among child psychiatrists that nocturnal enuresis is a regressive symptom indicative of emotional immaturity and instability may be countered with the suggestion that the nocturnal enuresis and other problem behavior are all symptoms of a more fundamental defect in the central nervous system. It is a common fallacy to pick one symptom or sign in a complex syndrome and use it as an explanation of the other symptoms when actually all the manifestations are caused by an obscure underlying defect or developmental failure. The child with enuresis may be emotionally unstable also because both symptoms are caused by an inadequacy or developmental defect of the central nervous system.

Only 10 men out of the 161 selectees reporting nocturnal enuresis after age 5 felt that treatments or exercises given by physicians had produced any improvement or cure of the condition. One man practiced withholding his urine during the day until control was achieved at night. One man went to sleep each night repeating to himself that the urge to urinate would awaken him. Another case was so embarrassed by sarcasm that he exerted a tremendous effort of will and cured himself. Two cases felt that medicines given by the doctor had some effect. Five cases were cured by various combinations of withholding fluids after 4 p. m., being aroused several times during the night, having to wash out soiled clothing, and parental punishments. In the other 151 cases, the condition either tapered off gradually or suddenly disappeared without apparent relation to therapeutic measures. It is probable that with increasing age some maturation process occurs in the central

nervous system which finally results in the disappearance of the symptom. These findings are in general agreement with the thesis that nocturnal enuresis is a developmental defect commonly associated with other defects of the central nervous system and which only disappears when a certain degree of maturation is achieved.

SUMMARY

Nocturnal enuresis persists into adult life much more commonly than generally recognized. Although normal children are supposed to gain bladder control before age 3, 16.1 per cent of a group of 1000 consecutive selectees questioned at an army induction station reported enuresis after age 5. Two and one half per cent did not gain control until age 18 or later and isolated cases continued bed-wetting to age 33. Associated nervous or mental conditions were noted in 63 per cent of the cases reporting enuresis. A study of 369 inmates of a state school for mental defectives revealed enuresis in 83.8 per cent of a group of 54 idiots, 12.8 per cent of 164 imbeciles and only 4 per cent in 125 morons. It is suggested that nocturnal enuresis may frequently be regarded as a developmental defect which disappears spontaneously when maturation within the central nervous system is completed. Since the incidence of enuresis tends to decline with increasing age it follows that almost any method of treatment will be effective if instituted at the proper time.

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PHILADELPHIA AND PSYCHIATRY, 1944

INTRODUCTION

HAROLD D. PALMER, M.D.

Psychiatry has never in its history been faced with so many opportunities and responsibilities as in this centenary year of The American Psychiatric Association. To the expanded civilian psychiatric needs so evident throughout the last decades have been added the more pressing demands of war psychiatry. Philadelphia's army induction center, one of the largest, requires the services of 10 experienced psychiatrists daily; and the large number of rejections for neuropsychiatric disabilities at the army induction centers still falls far short of eliminating the mentally unfit. The rate of discharge from the armed forces for neurotic or psychotic breakdowns is known to be extremely high, and these casualties not only present a serious therapeutic responsibility but demand more effective preventive efforts.

In 1932 there was published in this JOURNAL (Vol. XI: 969-1009, March 1932) a description of Philadelphia's psychiatric resources of that day. The institutions and organizations there described continue to operate over widened fields of service and a number of new groups have been formed. In the 12 years since 1932 the chairs of psychiatry have become vacant and reoccupied in four of the five Philadelphia medical schools. The one exception is the professorship of psychiatry at the University of Pennsylvania held by Dr. Edward A. Strecker, the distinguished president of The American Psychiatric Association. A new institution, the Philadelphia Psychiatric Hospital, with a capacity of 60 beds, was opened in January 1941, and to date has treated nearly 1000 cases. The Philadelphia Psychoanalytic Society was founded October 27, 1937. In August 1942, the Bureau of Medicine and Surgery of the United States Navy directed the organization of a special 3-months course of instruction in neuropsychiatry for naval medical officers, using the United States Naval Hospital in Philadelphia as training base. The course, which includes 420 hours of clinical, didactic and laboratory instruction, was organized under the direction of Capt. Richard H. Laning by Capt. Clifford Hines, chief of the neuropsychiatric service, in collaboration with Dr. Edward A. Strecker, Dr. Lauren H. Smith and Dr. Joseph Hughes, and is under the general supervision of Commander Edward L. Bortz, instruction officer at the United States Naval Hospital. Five classes have now been graduated and a sixth is under way. The Hall-Mercer Hospital, situated within the physical facilities of the Institute of the Pennsylvania Hospital, was established in 1941. The Philadelphia Orthopedic Hospital and Infirmary for Nervous Diseases, long the center of Dr. S. Weir Mitchell's remarkable professional activities, has been sold and the hospital service, personnel and tradition have been incorporated into the Medical School of the University of Pennsylvania. It will continue as a distinctly "special hospital" offering its unusual opportunities as in the past to the interested student of neuropsychiatry. The Pennsylvania State Psychiatric Society was founded in 1939 and adds the authority and influence of its extensive membership to all phases of constructive psychiatric effort.

The following brief statements have been contributed by representatives of the various psychiatric agencies in the city of Philadelphia.

THE PENNSYLVANIA HOSPITAL

EARL D. BOND, M.D.
Director of Research

(1) The Department for Sick and Injured—Eighth Street.

(2) The Department for Mental Diseases —Forty-fourth Street.

(3) The Institute (for Neuroses)—Forty-ninth Street.

Since Colonial times, when Benjamin Franklin was the secretary of the board, the Pensylvania Hospital has treated patients with mental diseases. For the first 90 years the same physicians treated mental, surgical and medical patients, but in 1841 the mental patients were moved to a farm in West Philadelphia and specialization began. There are four major achievements to the credit of the hospital: the book on mental diseases by Benjamin Rush in 1812; the model departments establishd and run by Thomas Kirkbride in 1841 and 1856; the out-patient clinic set up by John B. Chapin in 1885; the building of the Institute by Owen Copp in 1930.

At present mental diseases are treated at 44th Street—"The Department." All patients, as from the beginning, have private rooms. The Department is equipped to handle 200 patients according to the Kirkbride plan. That is, the patients are separated into four groups: (1) acutely ill, (2) less acutely ill, (3) convalescent, (4) chronically ill. Throughout the hospital group activity is considered of paramount importance and includes modern facilities for physiotherapy and occupational therapy. Recently group psychotherapy has been used.

A separate Markle Unit provides insulin and electric shock therapy. Approximately 300 cases have been given insulin therapy and approximately 500 cases have received electric shock therapy. New methods of treatment are enthusiastically being studied. An outpatient department is maintained at the 8th and Spruce Street hospital.

Neuroses are treated at the 49th Street division—"The Institute." As in "The Department" all patients have private rooms; they are under the care of private physicians who are members of the hospital staff. Group activity includes facilities for physiotherapy and occupational therapy as well as a separate building for swimming and indoor gymnasium games of all varieties.

The staff members carry on their private practice in offices within "The Institute." Specializations within the specialty have sprung up. The particular interests of the individual physicians have brought about intensive investigation into the endocrinological, neurological, metabolic, psychosomatic and psychoanalytical aspects of the neuroses. Within the physical confines of the Institute there has been set up (in 1941) the "Hall-Mercer Hospital" which furnishes an endowment for the study and treatment of "anxiety" in patients financially unable to afford private care. The practical results of the investigations of the staff members are here combined and are being carried on further under "ideal" clinical conditions for scientific investigation and application. From one year to another particular types of neuroses in homogenous groups of patients have been and will be studied. Constant intensive correlation of the various aspects of neuroses are recorded.

In conjunction with the clinical laboratory electroencephalographic investigations of the neuroses, convulsive disorders, behavior disorders, post-encephalitic sequellae are proceeding. The Rockefeller foundation maintains a laboratory for the biochemical study of brain metabolism.

There is also an active out-patient department. Five Rockefeller Foundation Fellows carry on psychotherapy of the neuroses as well as evaluation and disposition of those afflicted with mental disease. The primary purpose of the clinic is to serve the psychiatric needs of the community. Up to the war-time curtailment of fellowships this deparement handled approximately 1500 cases yearly. These young psychiatrists, now scattered throughout the country make up the greatest contribution the Pennsylvania Hospital has made to psychiatry.

There is a special clinic for the study and

treatment of migraine which now comprises a 3-day metabolic and psychiatric investigation of each patient followed by treatment.

In July 1943 the "Ivy School" for the study and treatment of children with language disabilities was started. Full time tutoring by a staff of trained teachers is now available on the premises.

Since the beginning of "The Institute" there has been a well-trained staff of psychologists whose primary aim is vocational guidance. Teaching facilities include biweekly conferences at which the O.P.D. cases are presented and discussed. Weekly lectures of practical psychiatric interest are given by staff members. Teaching is active for four medical schools. During the past year navy medical officers have received an intensive three months course in neurology and psychiatry.

FRIENDS HOSPITAL

THEODORE L. DEHNE, M.D.
Superintendent

Friends Hospital was the first private institution in America used exclusively for the care and treatment of the mentally ill. For over a century and a quarter, the hospital's activities have been closely identified with the development of psychiatry in the New World.

Early in the 19th century, a group of the Society of Friends founded what was then known as the "Contributors to the Asylum for the relief of persons deprived of the use of their reason," their purpose being the establishment of a hospital that would fill the need. They were greatly influenced by the work of their brother Quaker in England, William Tuke, whose efforts on behalf of the mentally ill had resulted in the building of the York Retreat, which became a model for a number of mental hospitals that were later to become widely known. The Contributors were resolved to do away with such widespread abuses as mechanical restraint, lack of proper classification and segregation, incarceration without occupational activities, and inadequate medical care—abuses which had very naturally arisen in a system whereby the mentally ill were treated in the same manner and under the same roofs as the criminal and the feebleminded. The first paragraph of the Constitution of the Contributors to the Asylum (1914) reads:

> We, the subscribers, members of the Yearly Meeting of Friends held in Philadelphia, desirous to provide for the suitable accommodation of that afflicted class of (those) with us who are, or may be, deprived of the use of their reason, as well as for the relief of their families and friends, have associated for the purpose of establishing an asylum for their reception, which is intended to furnish beside the requisite medical aid such tender, sympathetic attention and religious oversight as may soothe their agitated minds and thereby under the divine blessing facilitate their restoration to the enjoyment of this inestimable gift.

No clearer statement of their enlightened attitude could be made. A strong religious tone was evident; medical care alone was not believed to be enough.

The asylum was opened and the first patient admitted in May 1817. A tract of farm land outside of Philadelphia, near Frankford, provided a rural atmosphere with suitable occupations, as well as protection from the curiosity-seeker who for many years appeared to be accepted as part of the usual surroundings of the insane. The building was cleverly planned to permit some classification of the patients, because, so stated one of the early annual reports, "it is obviously disadvantageous to mingle the furious and the melancholy, the imperious and the fearful, the vociferous and the peaceful, the villainous and the religious, the clean and the unclean, the curable, incurable and the convalescent all together."

As little distinction as possible was made between the patient and the employee. Each was spoken of as a member of the asylum family, and they worked and lived together as closely as the patient's condition would permit. An attempt was made to supply each patient with employment about the building or farm similar to that to which he was accustomed. The principles of occupational therapy were recognized years before the term itself came into use. In 1834 all sec-

tarian restriction was removed and the institution was opened to any in need of care.

In 1888 the Friends Asylum Corporation was established according to the laws of Pennsylvania, succeeding the organization of the Contributors, and in 1915 the name of the institution was changed to Friends Hospital. A committee of the board of managers, members of the Corporation, visits the hospital every week for inspection and consultation with the superintendent and staff. The hospital facilities have been gradually expanded, the present bed capacity being about 170, thus allowing for satisfactory classification. There are 8 buildings on the 100 acre tract used exclusively by patients. The grounds have become widely known because of their extensive gardens and natural beauties.

The hospital staff has been engaged in teaching activities for many years. The nursing school was maintained from 1894 to 1935, when it was discontinued. In 1937 a course in psychiatry for student nurses from affiliated hospitals was established, and about 80 students per year are trained for periods of three months each. The affiliated schools include those of Hahnemann, Methodist, Frankford, Chester and Northeastern Hospitals. Graduate courses in mental disease are also provided. The occupational therapy department always includes several students from the Pennsylvania School of Occupational Therapy. The hospital is approved by the American Medical Association, and The American Psychiatric Association for residencies in psychiatry. During the past few years, members of the staff have held teaching positions in the School of Medicine and the Graduate School of Medicine of the University of Pennsylvania, Jefferson Medical College, Hahnemann Medical College and Woman's Medical College.

Under war conditions, affecting every department of the institution, the medical staff has been reduced by 50 per cent. The former clinical director is now a Major in the United States Army, and the senior physician in charge of the department for men is a Lieutenant-Commander in the United States Navy. Staff members serve regularly on the Armed Forces' Induction Board. Instruction in psychitray is given selected groups of medical officers of the United States Navy and consulting services are offered to the Philadelphia General Hospital, the Abington Hospital and Nazareth Hospital.

To whatever additional uses the hospital's facilities will be put when psychiatric casualties become heavier with the progress of the war has not been established. An increased number of patients can be satisfactorily cared for if sufficient employees are made available. The members of staff are ready now as they were in 1863 and 1917 to shoulder whatever additional responsibilities those in authority ask them to assume.

THE PHILADELPHIA ORTHOPÆDIC HOSPITAL AND INFIRMARY FOR NERVOUS DISEASES

FREDERICK H. LEAVITT, M. D.

The Philadelphia Orthopædic Hospital and Infirmary for Nervous Diseases came into existence in October 1867 and was incorporated by an Act of the Court of Appeals. The purpose of the original hospital was to provide relief of all classes of persons suffering with bodily deformities and it was then known as the Philadelphia Orthopædic Hospital. In 1870 Dr. S. Weir Mitchell became associated with the institution and he noted that many of the physical deformities were due to diseases of the central nervous system. Later that same year Dr. Mitchell established "The Infirmary for Nervous Disease" and added that the name to the original title. This hospital, therefore, became the first in Philadelphia to be devoted to the relief of nervous disorders. In 1914, following the death of Dr. S. Weir Mitchell, a new out-patient department building was purchased with a legacy from his will, and this became known as "The S. Weir Mitchell Memorial" building.

The school of nursing was established in 1888 and had an average of 20-25 nurses in training most of the time. In 1888 the school of physiotherapy was founded at the hospital as a training center for men and women and

as an adjunct to the treatment of nervous and orthopædic conditions.

In the out-patient department were treated many cases involving the interlocking fields of neurology, psychiatry and orthopædics. To these clinics, conducted by such renowned physicians as S. Weir Mitchell and Charles W. Burr, came students from the graduate school of the university, other medical teaching institutions throughout the east and observers from many foreign lands.

The Philadelphia Orthopædic Hospital and Infirmary for Nervous Diseases was merged with the University of Pennsylvania July 1, 1938. The agreement was to the effect that the endowment fund of the Orthopædic Hospital, which was between one and two million dollars, the physical properties of the Orthopædic Hospital at 17th and Summer Streets, and all the equipment, were to be used to develop an orthopædic and neurological center on the grounds of the University of Pennsylvania, in the vicinity of 36th and Spruce Streets. The building is now known as "The Neurologic Institute of the Philadelphia Orthopædic Hospital and Infirmary for Nervous Diseases of the University of Pennsylvania."

In the spring of 1940 the hospital property at 17th and Summer Streets, including the S. Weir Mitchell out-patient pavilion, was sold complete with all of its furnishings and equipment to a corporate group of doctors, to be known as "Doctors Hospital."

In furtherance of the university's part of the merger agreement, the university authorities removed their maternity department from the Maternity Building at the corner of 36th Street and Hamilton Walk at the rear of the main Maloney clinic building, and then turned over the building to the newly developed neurological department, which was in effect a union of the existing neurological department of the University Hospital and what was left of the neurological department of the original Orthopædic Hospital. A final transfer of patients from the Graduate Hospital, where the old hospital had taken temporary quarters, to the university took place February 3, 1942.

The out-patient department of the Orthopædic Hospital continued to function at 17th and Summer Streets until February 21, 1942 when it too was closed and the Mitchell Memorial Building housing it was taken over by Doctors Hospitals. At the present time neurological out-patient clinics are held thrice weekly in the old Maternity Building.

The practices and traditions of the Orthopædic Hospital still live in the memory of many noted doctors who had received training within its walls. Those still living trust that when happier days return to America, the full potentialities of the neurological department of the University of Pennsylvania will be developed and that another large and useful specialized practice and teaching hospital will be added to the Philadelphia group.

THE PHILADELPHIA PSYCHIATRIC HOSPITAL

N. W. WINKELMAN, M.D.
Medical Director

The Philadelphia Psychiatric Hospital was moved to its present location, Ford Road and Monument Avenue, January 17, 1941. It is non-sectarian, a member of the Federation of Jewish Charities and derives some of its support from the United Charities. It accepts private, semi-private and ward cases and where investigation shows that the relatives can contribute nothing to the maintenance of the patient, he or she is admitted free.

The bed capacity is approximately 60, but admissions have been restricted recently to between 45 and 48 because of the help situation. During the first two years' operation, the hospital admitted 895 patients. The average stay has been 50 days. Before a patient is admitted (unless an emergency) an application form must be filled in by a psychiatrist connected with the hospital and submitted to the admission committee, whose decision is final.

Patients are studied from every angle, including electroencephalography and routine electrocardiography. Every patient has complete dental check-up and all foci of infec-

tion are removed. Cases are reviewed at the regular bi-weekly staff meetings and interesting and unusual cases are presented to the visiting staff at weekly conferences. If the patient obviously requires long or indefinite treatment, the referring physician and family are notified to remove him to another institution for such care. If there is some hope of relief, treatment is begun, including general medical care, individual psychotherapy, occupational therapy, recreational therapy, physical therapy, narcosis therapy, fever therapy and the shock therapies with insulin and electricity.

Two visiting chiefs are on duty at the same time for a period of four months. They also give lectures to the resident and nursing staff throughout the year. An annual lecture is given by an outstanding psychiatrist under the terms of a lectureship established by the board of directors in honor of Mr. Samuel Radbill, the president of the hospital.

A psychiatric out-patient clinic is now in the process of formation. Here there will be close coordination between psychiatrist, psychologist and psychiatric social worker. Consultants in each field of medicine are available.

An expansion program is now in contemplation. Architects are working on plans to enlarge the hospital to 150 beds as soon as the war ends.

PSYCHOPATHIC DEPARTMENT OF THE PHILADELPHIA GENERAL HOSPITAL

JOHN F. STOUFFER, M.D.
Physician and Psychopathologist

In looking over its 212 years of care of the mentally ill, one can trace the changes in the Philadelphia General Hospital from shockingly inadequate treatment to modern scientific methods.

The first provision for care was made in 1732 when a building called the Philadelphia Almshouse was erected on a square of ground bounded by 3d and 4th, Spruce and Pine Streets. This one building was to house the poor, the sick, the infirm and the insane. By 1765 overcrowding made it necessary to remove to a larger building a few blocks away.

The almshouse was in no way adapted to care for insane patients, and violent cases were usually boarded at the Pennsylvania Hospital where arrangements were safer and better. Because of the financial burden this plan involved, it was decided to convert a basement wing of the almshouse into cells, and in December 1803, 10 of the most violent cases were removed from the Pennsylvania Hospital to this underground prison.

These cells are described as damp, chilly caverns, with insufficient light and improper ventilation. They were close to the sick and surgical wards and the noise of these "creatures bereft of reason" exerted an unpleasant influence on the sick.

Nothing was done to improve these deplorable conditions until 1834 when 92 insane and a number of poor were moved to a farm outside the city in the township of Blockley. The name "Philadelphia Hospital" was adopted for the department of the almshouse that cared for the sick, although it was generally known as and continues to be called "Blockley."

A spark of hope for better conditions was kindled in 1849 when an assistant physician was appointed to the insane and small-pox departments at a salary of $500 a year. However this position was abolished in 5 years and the asylum lapsed into disorder and decay. The history of this period of the middle 19th century was indeed one that swung from a few years of intelligent effort to remedy conditions to years of complete chaos and back again to some kind of order.

On September 24, 1859 the insane were separated from the Health Department and placed under the care of a medical officer, Dr. S. W. Butler, at a salary of $1000 a year. Here at last was an actual attempt to improve the care of the mentally ill. Industry took the place of idleness and inmates who were able were engaged in some type of work such as cultivating a garden, sew-

ing or repairing shoes. From this time on we see progress.

Previous to 1890 patients of doubtful mental state or in the early stages of insanity were admitted to the delinquent or alcoholic wards which were a part of the medical department under the direction of the visiting physician. In 1890 an observation ward, separate from the alcoholic ward, was established. To this newly created ward cases in which alcoholism or insanity or both were doubtful, were assigned for observation and diagnosis. This ward was under the immediate control of the chief resident physician or his assistants. Members of the neurological visiting staff were often called for consultation. Cases that proved to be definitely insane were transferred by proper legal process to the insane department.

In 1906 the detention wards were reorganized and placed under the supervision of the visting neurologists who were required to visit the patients twice a week. During their absence the chief resident physician was in charge.

In 1912 the psychopathic wards were established, under an Act of Legislature, making it lawful for the trustees or managers of any hospital maintaining medical and surgical staffs, in which courses on mental disease open to the medical students were given, to maintain, subject to the approval of the Board of Public Charities, psychopathic wards for the temporary care of persons suffering with mental disorders.

In 1916 due to the great increase in applications for admission, the psychopathic department was made a separate division, having no connection with any other department. Dr. S. DeW. Ludlum, Dr. S. F. Gilpin, Sr., Dr. A. C. Buckley and Dr. S. D. Ingham were the first psychiatrists appointed, two to serve six months each.

In 1921 the position of chief resident physician and psychopathologist was created and Dr. Franklin G. Ebaugh was appointed. He organized the neuropsychiatric clinic in July 1921. This clinic has steadily increased; in 1942, 13303 visits were made. In December 1924 Dr. Ebaugh resigned and Dr. John F. Stouffer was appointed in March 1925, when the title was changed to physician and psychopathologist.

In 1929 the laboratory of clinical and physical chemistry was established by Dr. S. DeW. Ludlum. This was the first laboratory of its kind established in Philadelphia. Dr. A. E. Taft, Fellow in psychiatry, is in charge of the experimental biochemical work.

In 1931 the new six story psychopathic building with capacity of 300 beds was occupied. Here patients are admitted for investigation, and for special treatments such as malaria inoculations, typhoid vaccine and electro-pyrexia for neurosyphilis; insulin, metrazol and electric shock; and intravenous vitamin, insulin and glucose therapy for delirium tremens. Patients requiring prolonged treatment are recommended for commitment to a mental institution such as the Philadelphia State Hospital or to a private hospital. Two committing chiefs are appointed through Civil Service examination for this work. During the year 1942, 4560 mental patients of all types were admitted. Of this number 1474 were committed to mental hospitals.

The psychopathic department holds a very prominent position in the teaching of clinical psychiatry. The staff consists of a full-time physician and psychopathologist, an assistant, 12 visiting psychiatrists and their assistants who serve six months each, 6 internes who serve two months each, a visiting medical consultant, and his assistant who serves twelve months, a psychiatric consultant to the other wards of the hospital and two psychiatric social workers. The visiting staff is appointed by the director of the Department of Public Health, and includes teachers from every medical school in the city.

About three hours per day are devoted to lectures and ward classes for the undergraduates and postgraduates of the various medical schools, and courses in psychiatry are also given to the nurses of this and other city hospitals. At the present time there is a course in psychiatry for the navy medical officers.

Credit is accorded for most of the facts of the early history of the insane department contained in this article to papers by D. Hayes Agnew, M. D. and Charles K. Mills, M. D., Croskey's "History of Blockley" and Lawrence's "History of the Philadelphia Almshouse and Hospital."

THE PHILADELPHIA STATE HOSPITAL

CHARLES A. ZELLER, M. D.
Superintendent

The Philadelphia State Hospital was placed under control of the Commonwealth of Pennsylvania October 22, 1938. Previously it was known as the Philadelphia Hospital for Mental Diseases (Byberry), and was owned and administered by the city.

This institution comprises 1100 acres of land and 96 buildings. Three new buildings erected recently and housing approximately 1600 patients, have considerably relieved the previous extreme overcrowding. As soon as new construction again becomes possible a building program is projected to increase to 10,000 the present bed capacity of 6100, in order to anticipate the needs of this area within the next few years. The yearly admissions average 1300, practically all coming from Philadelphia County, through the Philadelphia General Hospital. The expansion program includes a large admission building to which patients may be sent directly from their homes.

All the services and activities required in a modern mental hospital are provided, although at present necessarily operating on a somewhat reduced schedule. For example prescription of physiotherapy has had to be cut down as there remains but one of our quota of 4 licensed full-time physiotherapists. Insulin shock therapy has been discontinued because of staff shortage, but electroshock therapy has been continuously in use for 2½ years.

Libraries for patients contain more than 2000 volumes. There is also a medical library of nearly 800 volumes which is kept up to date. With the expansion of the institution will go an increase in training facilities as well as in preventive work. In one of the projected new buildings a complete wing of four floors will be given over to laboratories and research activities.

The hospital has recently had the approval of the American Medical Association for training of residents in psychiatry, and the courses given annually together with the experience gained at this institution, have enabled many of the staff members to meet the requirements of the American Board of Neurology and Psychiatry for certification. Steps are being taken for affiliation for nurses from a number of the Philadelphia hospitals.

THE MEDICAL SCHOOL OF THE UNIVERSITY OF PENNSYLVANIA

KENNETH E. APPEL, M. D.
Assistant Professor of Psychiatry

Instruction in psychiatry at the University of Pennsylvania is given by Dr. Edward A. Strecker, the professor and chairman of the department, and his staff of 29 psychiatrists. This instruction is now part of each of the four years of medical studies.

The *first year* course includes lectures on the effect of emotion on physiological processes and on the emotionally determined imbalances of the autonomic nervous system, with illustrations from laboratory investigations of such relationships in human subjects and animals.

In the *second year* are considered the effects of pathological or long continued emotion on the functioning of specific organ-systems. Thus the student is introduced early in his course to psychosomatic medicine.

In the *third year* Dr. Strecker gives lectures on systematic psychiatry and clinical demonstrations.

Fourth Year. Conferences in the general hospital. A psychiatric consultation service is maintained for the study of patients in the medical wards. A diagnosis of functional disturbances is made on the basis of *positive* findings instead of by exclusion of observable pathological changes or negative laboratory studies. By such means, unnecessary laboratory studies can often be dispensed with. Discussion of cases with students and

internes in medicine and surgery and with referring physicians serves to demonstrate the practical value of psychiatry in the various medical fields.

In addition to the regular courses in psychiatry, evening tutorial seminars are held monthly for small groups of the senior class. The students take the initiative in these informal discussions which have proved to be of considerable value.

Four lectures devoted exclusively to the problems of military psychiatry have been incorporated into the teaching program.

In view of the increasing importance of psychiatry both in military and civilian medicine, it is hoped that in the not too distant future a six or eight weeks clerkship in a psychopathic hospital together with work in a psychiatric out-patient department, will be part of the medical student's regular instruction, and required before he receives his degree.

JEFFERSON MEDICAL COLLEGE

ROBERT A. MATHEWS, M. D.
Assistant Professor of Psychiatry

The Department of Nervous and Mental Diseases of the Jefferson Medical College had its beginning in 1892 when Dr. Francis X. Dercum was elected clinical professor. In 1900 the department gained independent status when he was elected to a full professorship, a position he held with great distinction until his resignation in 1925. He was Professor Emeritus until his death, April 23, 1931.

During his teaching career Dr. Dercum developed many neuropsychiatrists now scattered throughout the country. Dr. Dercum held an unique position, not only in this country but abroad. He became a foreign corresponding member of the Neurological Society of Paris, a member of the Royal Society of Budapest, a corresponding member of the Psychiatric and Neurological Society of Vienna, and in 1922 the Government of France created him a Chevalier of the Legion of Honor. He was a member of the Wistar Association; he served in the Medical Reserve Corps during the First World War and at the time of his death was president of the American Philosophical Society.

Dr. Edward A. Strecker, one of Dr. Dercum's former students, was elected to succeed him. Dr. Strecker greatly enlarged the activities of the department of psychiatry and the teaching schedule. In 1931 he resigned his position at Jefferson to become professor of psychiatry in the University of Pennsylvania.

In 1934 Dr. Michael A. Burns, associate professor of nervous and mental diseases, was appointed professor of neurology and head of the department of nervous and mental diseases. He died in 1938, and was succeeded by Dr. Bernard J. Alpers, while Dr. Baldwin L. Keyes served as head of the department of psychiatry. In October 1941 Dr. Keyes was made full professor of psychiatry and the two divisions which for some years had been functioning independently, became officially separate departments. In May 1942 Dr. Keyes, a Lt. Colonel in the Medical Reserve Corps, U. S. Army, was ordered to active duty as head of the Jefferson Unit, Base Hospital #38. He has been overseas since September 1942.

Through the influence of Drs. Burns, Alpers and Keyes, courses in psychiatry are now included in all four academic years. The *first year* class receives 10 didactic lectures on fundamental psychiatric concepts, including mental hygiene principles of value to the students themselves. In the *second year* there are 10 didactic lectures on the history of psychiatry, the various "schools," etiology and classification. *Third year* students have 20 lectures on the major psychoses with 15 clinical demonstrations utilizing case material from the psychopathic department of the Philadelphia General Hospital. They also receive 10 hours of practical demonstration in the children's psychiatric out-patient department. The *fourth year* includes 15 lectures on the psychoneuroses and psychosomatic problems and 15 hours of ward work in the psychopathic de-

partment of the Philadelphia General Hospital. A psychiatrist is available for consultation with students serving clinical clerkships in the medical wards. Optional work in the psychiatric outpatient department and at the Philadelphia General Hospital is available for a limited number of students.

Plans have been formulated for a more extensive liaison relationship between the medical and psychiatric departments, with increased teaching hours on the medical wards and in the medical out-patient clinics. A full-time teaching Fellowship in psychiatry was created last year.

TEMPLE UNIVERSITY SCHOOL OF MEDICINE

O. SPURGEON ENGLISH, M.D.
Professor of Psychiatry

The chairs of neurology and psychiatry were separated in 1928, the department of psychiatry being conducted by Professor Max Bochrach. Since Dr. Bochrach's death during the school year 1932-33, the department has been conducted by the writer.

During 1932 Dr. Gerald H. J. Pearson, now clinical professor of child psychiatry, began psychiatric work with children in the department of pediatrics. This includes lectures to the junior class on psychiatric problems in children with out-patient work in the same field for the seniors. In 1933 lectures in psychiatry were introduced into the first and second years of the medical curriculum. Twelve lectures on personality development are given to the freshmen and 18 lectures to the sophomores on psychiatric problems of the successive life epochs. During the junior year a combined lecture and clinic is given weekly at the Philadelphia General Hospital where cases are worked up and presented by the students with supervised discussion. During the senior year there are 2 hours of out-patient work in the psychiatric clinic at the Temple University Medical School each week, in which instruction in psychotherapy is given to small groups. Through the courtesy of Dr. Charles L. Brown, professor of medicine, psychosomatic clinics are conducted by the psychiatric staff in conjunction with the medical department.

The teaching aim of the psychiatric department is: first, to help students see the average variations of human nature in action; second, to enable them to understand the psychoneuroses and psychoses; and finally, to give them an insight into the relation of the emotions in the manifestations of somatic disease.

WOMAN'S MEDICAL COLLEGE OF PENNSYLVANIA

HAROLD D. PALMER, M.D.
Professor of Psychiatry

Objectives of psychiatric teaching at the Woman's Medical College are: *First:* Indoctrination of the student with a desire to know more about the human mind. *Second:* Relating psychiatry to the every-day life of the student and to what he observes in the medical, surgical, pediatric, obstetrical and other patients. *Third:* Teaching psychopathology as observed in every-day life, as well as in the neuroses and psychoses, with little emphasis on nomenclature and classification. *Fourth:* Presentation of therapeutic methods, and correcting the traditional idea of poor prognosis that has by no means been dislodged from the minds of medical practitioners generally, or even from the minds of our medical, surgical, pediatric, obstetrical and other specialist colleagues. *Fifth:* Making the student aware of his responsibility in the social application of psychiatry and in passing on the principles of mental hygiene and child guidance to parents and teachers. *Sixth:* Setting forth the new responsibilities in the treatment of military and civilian neuropsychiatric casualties related to war.

The staff of the department of psychiatry, like that of all medical schools in America, has been severely depleted by the demands of the armed services. Of the pre-war staff of 14, only 5 remain to carry on the recently expanded teaching program. Eighty-eight hours of instruction are distributed throughout the four years of medical college, and 120 hours of informal clinical service and supervision are given.

The great variety of methods of teaching *first year* psychiatry bespeaks the lack of any generally successful plan. After experimenting with didactic presentation for several years it was decided that the essential subject matter could be compressed into 10 brief mimeographed lectures, comprising approximately 60 pages. The student is held responsible for a general knowledge of this material. The teaching hours are therefore freed for what we have chosen to call an "indoctrination" of the student with the more appealing and colorful aspects of psychiatry. A number of students are assigned interesting papers published in current medical magazines. To others are assigned books of semi-popular nature that present psychiatric or mental hygiene material, the history of psychiatry, etc. The students present their reviews to the class and the instructor leads the discussion. Ten hours are devoted to this first year course in "mental hygiene."

In the *second year* 10 lectures are given on the "psychobiology" of the normal individual as well as of the neurotic and psychotic subject. The rôle of emotion in the generation or aggravation of physical illness is discussed as a foundation for later lectures on psychosomatic medicine. Three lectures are given by the pediatrician attached to both the pediatric and psychiatric departments dealing with genetic psychology and the mental hygiene and behavior problems of childhood in health and illness.

In the *third year* there are 18 hours each of lectures and clinical demonstrations at the Philadelphia General Hospital, where the students are given an introduction to actual work with patients, take part in ward rounds and observe special treatment techniques. They receive case assignments and present the material before the class. Four hours of lectures and clinical demonstrations are given on mental defect at the Elwyn Training School.

In the *fourth year* the class is divided into four sections. Each receives 8 two-hour seminars at the Pennsylvania Hospital, department for mental and nervous diseases, and the Friend's Hospital. Cases are assigned for complete psychiatric work-up and presentation by the student, who is also quizzed on the historical material, the psychopathology, treatment indications, etc. The clinics at the Institute and at the out-patient department of the Pennsylvania Hospital are also used for similar work with the neuroses. Wherever possible the student takes part in the therapy. The psychiatric casualties of war are dealt with from the points of view of both prevention and rehabilitation.

An elective course of 16 hours is spent in the personal management of the psychoneuroses under the supervision of the director of the out-patient department and the faculty preceptor. Attendance at conferences of the Institute out-patient department staff are part of the instruction.

HAHNEMANN MEDICAL COLLEGE

EDWARD A. STEINHILBER

Professor of Psychiatry

Prior to 1912 the teaching of psychiatry at Hahnemann Medical College was under the able care of the late Dr. John J. Tuller. In 1912 Dr. Henry I. Klopp was appointed superintendent of the new Allentown State Hospital and Dr. Tuller made arrangements with Dr. Klopp to supplement work at Hahnemann Hospital by having senior students attend the Allentown State Hospital in subsections for 8 week-ends. A course of didactic lectures was given prior to the clinics at Allentown. A few years later the plan

was amplified to send the senior class to the Allentown State Hospital for a week of clinical psychiatry. Here the students go on ward walks on all services including the children's institute. Cases are assigned for individual study in addition to clinical lectures and demonstrations in the various therapeutic procedures. Students are divided into subsections for much of this work, also for quiz discussion groups. Instruction was given by Dr. Henry I. Klopp and staff until his recent retirement, and is now under the direction of Dr. Harry F. Hoffman, who also delivers the didactic lectures in psychiatry to the junior class at Philadelphia.

Subsection clinics on the psychopathic wards at the Philadelphia General Hospital under the direction of the writer have been temporarily discontinued during the present war emergency.

The clinical and didactic work of the last 2 years is preceded by a course in psychobiology and psychopathology in the sophomore year. It is our purpose eventually to divide these two subjects, placing psychobiology in the freshman year.

THE PHILADELPHIA PSYCHIATRIC SOCIETY

HAROLD D. PALMER, M.D.
President

The history of psychiatry in Philadelphia begins with the colonial physicians who took special interest in the mentally ill and with those public spirited citizens, headed by Dr. Benjamin Franklin, whose primary purpose in founding the Pennsylvania Hospital in 1751 was the care and treatment of the mentally sick. The names of Drs. Thomas Bond, James Hutchinson, Thomas Parke, Benjamin Rush and other early Philadelphia physicians were linked with many advances in the treatment of psychiatric problems. These men contributed numerous papers on mental disorders to the scientific programs of the Philadelphia College of Physicians. It was before this body that Dr. Benjamin Rush, Dr. Silas Weir Mitchell, Dr. Thomas S. Kirkbride and other eminent psychiatrists presented their scientific dissertations on the human mind.

The Philadelphia Psychiatric Society was organized January 11, 1909, with 27 charter members. Membership was limited to physicians specializing in mental and nervous disorders. Later (1911), at the suggestion of Dr. Francis X. Dercum, psychologists and biologists were admitted. However shortly thereafter the membership was again limited to physicians chiefly interested in the field of psychiatry.

Dr. Charles W. Burr was the first president, and two honorary members, Dr. S. Weir Mitchell and Dr. John B. Chapin, were elected at the organization meeting. Four of the 27 charter members are now living: Dr. Charles W. Burr, Dr. D. J. McCarthy, Dr. S. Dewitt Ludlum and Dr. S. S. Hill.

The first medical meeting held in the new College of Physicians building on 22nd Street, between Market and Chestnut Streets, was the regular November meeting of the Philadelphia Psychiatric Society in the year 1909. The program of the January 1918 meeting is of interest. Dr. T. H. Weisenberg presented a paper on "War Neuroses." Dr. Frankwood E. Williams discussed "Preparation in the United States Army for the Care and Treatment of Soldiers Suffering from Nervous and Mental Diseases." Dr. Charles K. Mills was appointed representative of the Society on Dr. Dana's War Work Committee of the National Committee of Mental Hygiene.

The present membership of the Society is 131. Twenty-nine are serving in the armed forces, and many members are also acting in consultation and advisory capacities to the Army, Navy, Coast Guard, Merchant Marine, United States Public Health Service, the local draft boards and the Army Induction Board, notably Dr. Edward A. Strecker, a former president of the Society. Five members have been elected to the presidency of The American Psychiatric Association.

Scientific meetings are held in January, February, March, April, May, October and November of each year and reported in the Archives of Neurology and Psychiatry. It

was at one of the early meetings in 1910 that Dr. T. H. Weisenberg described the use of moving pictures in the analysis of disorders of gait, athetosis, convulsions and other neurological conditions. This was perhaps one of the earliest medical uses of moving pictures. It was also in the regular scientific meetings of the Society that the first use of insulin in the treatment of psychiatric problems was described.

THE PHILADELPHIA CHILD GUIDANCE CLINIC

FREDERICK H. ALLEN, M.D.
Director

Organization.—The Philadelphia Child Guidance, located at 1711 Fitzwater Street, was founded in 1925 under the sponsorship of the Commonwealth Fund of New York and the National Committee of Mental Hygiene. After a 2½ years demonstration period, the clinic was financed by Philadelphia supporters and integrated into the social and health resources of this community. Since 1929 it has been a member agency of the Community Fund, supported by their annual grant and fees paid to the clinic for service ($3700 in 1942). The board of directors includes both lay and professional members. The budget last year was approximately $46,000 which provided for a full time professional staff of 2 psychiatrists (one in 1943-4), 7 social case workers and 1 psychologist.

Source of Cases.—The objective of the clinic is the treatment of children presenting behavior and personality difficulties referred by parents, schools, courts, physicians, social and health agencies, and representing families from every social and economic level. In 1942, 630 cases ranging from 2 to 18 years were referred. Close relations have always been maintained with the staff of the Children's Hospital upon whose grounds the clinic is located.

Training Program.—This organization has become one of the important training centers in this country for personnel to staff child guidance clinics. Students with proper professional background are given carefully supervised training while carrying therapeutic and case work on clinic cases assigned to them. Seminars constitute an integral part of the program.

Educational and Research Activity.—Members of the clinic staff have made important contributions to the periodical and monograph literature in this field. Teaching appointments are held by staff members in the University of Pennsylvania Medical School, the Graduate School of Medicine, the Pennsylvania School of Social Work and in the Department of Public Health Nursing of the University of Pennsylvania. In addition courses, institutes and lectures have been conducted for various professional and lay groups.

Development of Professional Method in Therapy and Case Work.—The Child Guidance Clinic emerged as a way of bringing together under a single structure the best knowledge of different professional groups concerned with children. The psychiatrist, social case worker and psychologist by applying conjointly their several techniques have acquired new skills and a broader knowledge of the problems of childhood. They were working in a virgin field, and the gains of the past two decades now make more clear the directions for further progress. The unique feature of the problems in child psychiatry is that they always concern relationships and not just an individual child or parent. The staff must deal with this relationship, and at the same time bring to the individuals concerned a clearer sense of their own part in the problems. During the years of intensive study of and with methods the emphasis has changed from one of doing things *to* parents and children to one of utilizing the inherent strengths of parent and child to help them to healthier uses of their lives together.

The parent who seeks the clinic's help is making an essential step that can lead to important changes in child and parent. This step may be their first open recognition that things are not right and that something must be done. Helping parents make fuller use

of the step they initiate is the first responsibility of the clinic staff. Schools, physicians and others may help them to take the step but it is the parent who acts—they come to the clinic without the child and in this first contact many things may happen. They find a person interested in what they have to say, and they are helped to state their problem. They learn how the clinic works, with its regular appointments for child and parent with 2 members of the staff. Appointments are usually once a week but in the more severe problems 2 or 3 interviews a week are arranged. The parent and child come together and the interviews are usually concurrent.

Psychological examinations, to determine the intellectual and educational status of a child, are given selectively rather than routinely. When physical problems are revealed the parent is helped to arrange for physical examination either by the family physician or through the clinical facilities of the community.

Throughout the conduct of a case, emphasis is kept on the 'working-with' procedure. The child has the opportunity to enter a new and significant relation with a therapist and has the support of a participating parent who has the same opportunity to learn through contact with the case worker. Thus may be establishd a more wholesome and mutually satisfactory parent-child relationship.

THE PENNSYLVANIA PSYCHIATRIC SOCIETY

LEROY M. A. MAEDER, M. D.
Secretary-Treasurer

The Pennsylvania Psychiatric Society was founded in Pittsburgh October 5, 1939. Baldwin L. Keyes, M. D., had recommended its establishment in his presidential address before the Philadelphia Psychiatric Society in January of that year, and the idea had also been suggested by several others of the founding Fellows of the Society.

The initial membership included 116 fellows, 40 members, 8 associate members, 3 honorary members and 3 life fellows. Corresponding membership is also provided. The honorary members are: Charles W. Burr, M. D., Philadelphia; Theodore Diller, M. D.,[1] Pittsburgh and J. Moorhead Murdoch, M. D., New Kensington. The life fellows are: Edward M. Green, M. D., Harrisburg; S. S. Hill, M. D., Wernersville and Henry A. Hutchinson, M. D., Dixmont. William C. Sandy, M. D., Harrisburg, was the first president and has been followed by Henry I. Klopp, M. D.; Baldwin L. Keyes, M. D.; George J. Wright, M. D. and Ralph L. Hill, M. D. George W. Smeltz, M. D., Pittsburgh, is president-elect. LeRoy M. A. Maeder, M. D., continues as secretary-treasurer.

[1] Deceased.

The Society was incorporated as a Pennsylvania non-profit corporation by decree of the Court of Common Pleas of Delaware County, December 30, 1939. It was affiliated with The American Psychiatric Association in 1940. The annual business and scientific meetings are customarily held at the time and place of the annual meeting of the Medical Society of the State of Pennsylvania in Philadelphia and Pittsburgh. Regular mid-year meetings have been held in Harrisburg and Allentown.

Committees have been established within the Society as follows: nominations, forensic psychiatry, mental hygiene, public health legislation, research, psychiatric education, medico-legal Bar Association, state institutions. The Pennsylvania Psychiatric Society and the Philadelphia Psychiatric Society are cooperating in a joint committee on the Philadelphia State Mental Hospital, under the chairmanship of Edward A. Strecker, M. D.

Many activities have commanded the attention of the Society. In February 1940 it endorsed "The Pennsylvania Plan for Intramural Training in Penal Psychiatry" as compiled by the Joint Medico-Legal Committee of the Philadelphia County Medical

Society and the Philadelphia Bar Association. It cooperated closely with the Governor of Pennsylvania in the same year in recommending the appointment of qualified psychiatrists to the 11 medical advisory boards of the Pennsylvania Selective Service Appeal Areas. It recommended to the Governor in 1941 the appointment of at least one psychiatrist to the new Pennsylvania Parole Board. The Society also worked with the Philadelphia County Medical Society in recommending member neuropsychiatrists in the Philadelphia area for service on army induction boards. The Society assisted the Committee on Military Mobilization of the American Psychiatric Association in the publication by the Family Welfare Association of America of the first training schedules on "Anxiety and Its Control," prepared by the committee for the use of civilian personnel.

In 1941 the Society conducted a questionnaire survey of its membership on the matter of sexual sterilization, the results indicating approval of permissive selective sexual sterilization of mental defectives. The Society, through its secretary-treasurer, conferred and cooperated with the Selective Service System regarding the greater application of psychiatry in the examination of registrants and selectees and presented a definite plan to this end. It has maintained a consistent interest in the establishment of the new Western State Psychiatric Hospital in Pittsburgh and in the maintenance of high standards of administration and care in public mental institutions, hospitals and departments.

MENTAL HYGIENE AND PUBLIC HEALTH DIVISION OF THE PUBLIC CHARITIES ASSOCIATION OF PENNSYLVANIA

A. H. PIERCE, M. D.
Medical Director (Resigned)

The Committee on Mental Hygiene was organized in 1913 as a division of the Public Charities Association of Pennsylvania. For many years its membership was limited to psychiatrists, but latterly interested laymen have been included. Its fundamental interests in mental hygiene have changed but little in the 30 years of its existence, although from year to year the immediate objectives have changed with circumstances. For example, in 1913, emphasis was placed upon a law establishing the State Village (for feebleminded women of child-bearing age) at Laurelton; in 1914 a six months' survey of all the state institutions for the mentally ill; in 1915 a new state mental hospital at Torrance; in 1916 a travelling exhibit on feeblemindedness, visited by more than 250,000 adult citizens; in 1917 the organization of mental health clinics in Philadelphia and 5 other cities and an amendment of the school code to provide special instruction for mentally handicapped children; in 1918 a study of state and county mental institutions by Dr. William C. Sandy; in 1919 "sifting" surveys as to school retardation and other mental problems of children.

In September 1919 Dr. E. Stanley Abbott was appointed first medical director. In subsequent years interest centered upon such matters as the organization of a Department of Welfare, in which was included the Bureau of Mental Health; the recodification of laws relating to mental health, resulting in the Mental Health Act of 1923 (which with few minor amendments is still in effect); the development and support of state-owned institutions and of child guidance clinics, of which the one in Philadelphia is an outstanding example; and continuing educational programs often in cooperation with university or other organized agency.

In 1931 legislation was secured for the establishment of the Western State Psychiatric Hospital in Pittsburgh, which, after many vicissitudes, culminated in the constructing of an ideal building, opened for patients in September 1942.

During the period from 1933 to 1938 the major objective of the committee was the complete state care of all mental cases. Pennvania was one of a very few states that had not adopted this policy. There were 13 county or city hospitals for the mentally

ill with an average population of about 14,941. Some of these institutions maintained reasonably high standards but many were distinctly inferior. The state operated 8 hospitals all with high standards. The need for this change was obvious and imperative. The intensive campaign to open the eyes of the public, and legislators in particular, finally bore fruit in 1938, when a suitable bill was passed and signed by the Governor to become fully effective June 1, 1939. The battle was not yet over however, as legislation was passed deferring the effective date to June 1, 1941.[2] However, one great gain was the immediate transfer of the Philadelphia Hospital for Mental Diseases at Byberry from the city to the state in October 1938. The many complications resulting from complete state care have been well met by the director of the Bureau of Mental Health in the Department of Welfare.

In October 1940 the Selective Service System was being organized and before November 1, action by the Committee assured the appointment of recognized psychiatrists to all medical advisory boards and to army induction boards. At the same time the desirability of "following up" those rejected by the Selective Service System and by the induction boards was stressed to those in authority. A legal opinion of Selective Service, however, prohibited any action being taken by the Bureau of Mental Health with regard to those suffering from neuropsychiatric conditions. This was based on the confidential character of information secured by Selective Service.

Efforts were made to induce the Selective Service System, both national and state, to approve a plan whereby army induction boards would be supplied medical information regarding selectees prior to their appearance for examination. This applied chiefly, but not exclusively, to neuropsychiatric conditions. It was urged that at least a check should be made against the files of the Bureau of Mental Health. State Selective Service authorities felt unable to undertake this without approval of the National Director. This was not forthcoming until March 1943, when it became possible to put into effect a plan suggested in February by the Mental Hygiene Committee. In brief the plan is this:

> On order of the State Director of Selective Service, local boards issue to each potential 1-A registrant two similar "identification cards." These cards properly completed are returned immediately to the local board. One card is sent to the State Director, where it is routed to the Bureau of Mental Health for check against its files and return. Information thus secured is relayed to local boards, where in many instances action is automatic. The second card is sent by the local board to a local "referral center," officially designated by the State Director in communities with organized social service, and elsewhere to the County Board of Public Assistance. There, information pertinent to prejudicial mental or physical conditions or history of the registrant is secured and a brief report "professionally confidential" is sent to the president of the medical board of the proper induction station, where it becomes available to the examining physician. Effective action has now become practically state-wide. In July the Selective Service System made identification cards an official form. This would seem to indicate an intention to extend our plan somewhat widely and perhaps justifies the details given above.

The understanding and enthusiastic cooperation of social service organizations and governmental agencies account for the success achieved. In such large centers as metropolitan Philadelphia, covering 5 counties and in Pittsburgh, the task was especially difficult. In Harrisburg the first referral center went into action and did experimental work. Mention of these three does not detract from the credit to all who undertook this work, always involving many volunteers, and in many instances an allotment of funds from local sources.

While the war has provided this opportunity for constructive work, it also has placed definite limitations on other interests. For example, all recognize the need for even higher standards in public hospitals and an extension of mental health and child guidance clinics. With the diversion of psychiatric and other medical personnel to the armed forces, with the depletion in the nursing and attendant groups, one must recognize the difficulty in maintaining present standards, to say nothing of raising them. It would seem more in order to give sympathetic support to administrative officers

[2] An attempt to postpone the effective date another two years was defeated.

who are doing the best they can under almost overwhelming difficulties, than to prod them to attempt the impossible. Ideals may be postponed but not relinquished.

In July 1943 the writer resigned as medical director in order to accept duty "for the duration" as assistant superintendent of the Philadelphia State Hospital.

THE PSYCHIATRIC CLINIC OF THE COMMUNITY HEALTH CENTER

PAUL SLOANE, M. D.

The Psychiatric Clinic of the Community Health Center is situated in the Jewish Federation Building at 330 South 9th Street. It is one of a group of clinics, which includes also medical diagnostic, dental and psychological clinics. The agency is largely cooperative, deriving most of its clients from social agencies, although the services are available to any needy individual in the Jewish community. Patients of all ages and both sexes are seen. There is a full-time psychologist, to whom individuals are referred for psychological testing (including Rorschach where indicated), educational and vocational guidance and counselling. An executive secretary has charge of all the clinics connected with the Community Health Center.

At present the psychiatric service is on a part-time basis. The amount of time available varies according to the demand, averaging about 3 hours weekly, cases being selected on the basis of hopefulness in the therapeutic results. Clients come mostly from the upper adolescent and adult group; those in the younger group presenting behavior problems are referred to the child guidance clinic.

It is the policy of the clinic to concentrate attention on cases which merit intensive treatment, and in these cases cooperation is obtained from the agencies. Physical and psychological examinations are available at the discretion of the psychiatrist. Conferences are held between the agency worker interested in the case and the psychiatrist for the purpose of clarifying the psychiatric factors involved, as well as for clearing up immediate problems with which the social worker is concerned. These conferences offer excellent opportunity for teaching.

UNITED STATES NAVAL HOSPITAL, PHILADELPHIA

The Special Course in Neuropsychiatry for Medical Officers of the Navy

CAPT. RICHARD H. LANING, M. C., U. S. N.
Medical Officer in Command

The rapid expansion of the Medical Corps of the United States Navy created an immediate demand for the services of qualified medical officers in a number of special fields. Doctors with special training in psychiatry and neurology are essential for personnel selection, the care of patients in base hospitals, for sea duty, and for field service with combat units. As the number of qualified men available was limited, the Bureau of Medicine and Surgery authorized short, intensive courses conducted by experts in the field of psychiatry in certain medical centers of the United States.

The educational facilities in Philadelphia for training medical officers of the Navy are excellent. Philadelphia has five grade "A" medical schools. Moreover, the Graduate School of the University of Pennsylvania is available for purposes of instruction. In addition to a faculty in neuropsychiatry which is of superb dimensions, the number of patients available for study groups, lectures, clinic demonstration is ample to guarantee a wide variety of psychiatric problems for teaching purposes.

The Naval Hospital in Philadelphia, available to active naval personnel and veterans alike, who require hospitalization, has a continual flow of psychiatric cases requiring the services of a specially trained staff. For the instruction of naval medical officers the com-

bined teaching faculties of Philadelphia's great medical schools with the staff in psychiatry at the Naval Hospital are available.

In August 1942 the Bureau of Medicine and Surgery authorized a special 3 months course in psychiatry using the Naval Hospital as training base. Student doctors with special aptitude in psychiatry and neurology have been sent to Philadelphia in groups of 12 to 15 to a class. The close contact with instructors that these small classes make possible is of great advantage.

The course was organized by Captain Clifford G. Hines, chief of the neuropsychiatric service, in collaboration with Dr. Edward A. Strecker, professor of psychiatry at the University of Pennsylvania, Dr. Lauren H. Smith, physician-in-chief and administrator of the Institute of the Pennsylvania Hospital, and Dr. Joseph Hughes, director of laboratories. All postgraduate courses are under the general supervision of Commander Edward L. Bortz, MC-V(S) USNR., serving as instruction officer at the U. S. Naval Hospital in Philadelphia.

The deans of Philadelphia's medical schools have been most generous in extending invitations to student medical officers to attend teaching ward rounds and other activities of their curricula. In addition, the library of the College of Physicians, one of the finest in the land, is available for collateral reading. The first group of officers for psychiatric training, 15 in number, reported October 1, 1942. Additional groups have been taken on at intervals and the sixth classes are now in training.

THE PHILADELPHIA PSYCHOANALYTIC SOCIETY

GERALD J. H. PEARSON, M. D.
President

The Philadelphia Psychoanalytic Society was founded October 27, 1937, the charter members being Sidney G. Biddle, M. D., O. Spurgeon English, M. D., LeRoy M. A. Maeder, M. D. and George W. Smeltz, M. D. Lecture courses and seminars were begun during the academic year 1937-1938 and have continued in increasing numbers. Regular meetings, business and scientific have also been held. On September 30, 1938, the library of the Philadelphia Psychoanalytic Society was established and in May 1939, the Society was admitted as a constituent society of the American Psychoanalytic Association.

Incorporation as a Pennsylvania nonprofit corporation was decreed by the Court of Common Pleas of Delaware County December 30, 1939. On January 8, 1940, the Society became a branch member of the International Psychoanalytic Association. The Philadelphia Psychoanalytic Institute, under the direction of this Society, was founded in 1940 and recognized by the American Psychoanalytic Association in the same year. The Psychosomatic Research Clinic was established by the Society February 23, 1943.

The Philadelphia Psychoanalytic Institute offers two types of instruction. The first consists of a 3-year didactic and seminar course for physician candidates in training to be psychoanalysts. The second is an extension course given to bring data obtained through psychoanalytic research to the attention of professional workers in general medicine, education, social work, sociology and religion. The course for practicing physicians consists of lecture discussions on the fundamental principles of psychic functioning and on the newer data in the field of psychosomatic medicine. (These courses for physicians have been discontinued temporarily on account of the war.) Courses for social workers and sociologists cover the application of psychoanalytic knowledge to social case work. For teachers and ministers there is a 2-year course dealing with the emotional development of the normal child from birth through adolescence, and the factors which cause emotional maladjustment in children. After completing these 2 years the student is eligible to attend each year a series of lectures on some special phase of children's problems. This year's series is on the child with educational disabilities.

CLINICAL NOTES

A NOTE ON THE INCIDENCE OF RHEUMATIC HEART DISEASE AMONG CRIMINAL PSYCHOPATHS[1]

In studying mentally ill patients one frequently obtains a history of some illness or injury that might easily have caused some permanent damage to the central nervous system but it is usually impossible to prove that the illness or injury in question is etiologically related to the mental illness in the individual case. This is particularly true of rheumatic fever. Whenever we find a patient with a severe behavior problem who also has rheumatic heart disease we suspect a diagnosis of rheumatic encephalopathy because we know that rheumatic fever is a generalized illness and occasionally results in definite cerebral lesions(1, 2). We have been encouraged in this line of thought by the recent discovery, confirmed by several investigators, that a high percentage of psychopathic individuals have abnormal electroencephalograms(3, 4, 5, 6).

If rheumatic encephalopathy were occasionally a cause of psychopathic behavior one would expect the incidence of rheumatic heart lesions to be more common among criminal psychopaths than among a population of average mental characteristics. Such a relation has been shown to exist between convulsive states and rheumatic fever(1). There have been 662 patients admitted to the psychopathic unit of the Medical Center for Federal Prisoners at Springfield, Mo., since it was opened in 1940. The bulk of these patients are criminal psychopaths selected from the Federal prisons all over the country because of the severity of their psychopathic manifestations. In only four of these patients have definite rheumatic heart lesions been diagnosed, an incidence of 0.60 per cent. A suitable control group appears to be furnished by a group of 45,585 eighteen and nineteen year old selective service registrants in which the incidence of rheumatic heart lesions was 1.49 per cent(7). These selective service registrants were selected from all over the nation indiscriminately as were our patients. Our patients constitute a somewhat older group, the average age being about 22. Sixty-five per cent of our patients were between the ages of 16 and 25 when first examined by us and only 16 per cent were over 30. There was a higher percentage of Negroes among our group than among the selective service registrants (12.4 per cent and 7.2 per cent respectively) and presumably our patients have a lower economic background than that of the unselected population. Both of these factors would tend to make the incidence of rheumatic heart lesions higher in our group.

[1] From the Medical Center for Federal Prisoners, Springfield, Mo.

SUMMARY

Rheumatic heart lesions were present in 0.60 per cent of a group of 662 criminal psychopaths as compared to an incidence of 1.49 per cent in a roughly comparable control group of 18 and 19 year old selective service registrants. Rheumatic encephalopathy must be a very infrequent etiologic factor in the criminal types of psychopathic personality.

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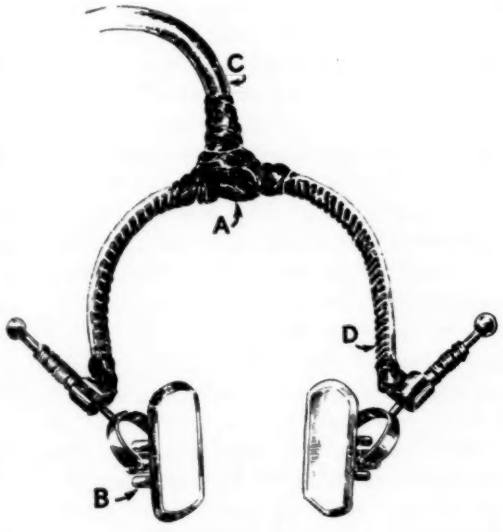
NEW HEADPIECE FOR ELECTRIC SHOCK THERAPY

The accompanying illustration demonstrates the simplicity and obvious ease in application of a new headpiece for electric shock therapy. The headpiece consists of an appliance similar in application and structure



A. Wood Nonconductor.
B. Electrodes.
C. Connecting Cord.
D. Spring Steel Head Piece.

to the usual radio or wireless hearing apparatus. The headband is of spring steel, to which are attached the two electrodes. The spring steel is molded to the shape of the head, so as to fit comfortably. Due to the normal tension the side pressure of the spring steel holds the two electrodes very firmly over the temporal areas, which cuts down resistance to a fractional amount. The connecting cord is well insulated, and runs from the electrodes along the headpiece to the machine. A non-conductor of fibre wood is placed in the center, into which the spring steel is dovetailed. This prevents the too wide diffusion or any shorting of current.

The writer labored for several months with the prevalent clumsy, time-consuming, fear-producing apparatus in use in either the hand application or the constricting rubber band. Patients objected to this naturally, because of the discomfort and the fear produced by the constriction, as well as the delay in application. This is found particularly true in the suspicious or acutely excited patient for whom it is difficult enough to attempt the treatment without additional fumbling in preparation. The perusal of the literature reveals no other such apparatus in use at the present time.

I have used the above headpiece in over a thousand treatments, and have had no failures in the treatment or complaints of fear-producing reactions from the patients. All that is necessary is simply to connect the machine, place the headpiece directly over the patient's head with the electrodes fitting comfortably over the temporal areas of the scalp where the electric paste has been applied. The procedure takes only a few seconds.

N. K. Rickles, M. D.,
Seattle, Wash.

COMMENT

MENTAL HYGIENE DEVELOPMENTS IN VIRGINIA

The Commonwealth of Virginia has made preparations for a greatly expanded program in state hospital construction and state-wide mental hygiene services at once upon termination of the war. Leading up to this development several important steps had been taken in the recent past. Prior to 1937 the state hospitals had been managed by an unwieldy board made up of the boards of control of the 6 institutions. In that year the governor appointed a State Hospital Board of 7 members, 3 of whom are physicians, including 2 psychiatrists. The new Board was empowered to select a director, and Dr. Hugh C. Henry, a man of wide experience in mental hospital administration was appointed.

Next, the Mental Hospital Survey Committee, under the leadership of Dr. Samuel W. Hamilton, was invited to make a survey of the Virginia hospitals, and this was done. In carrying out recommendations of the survey committee, several clinical directors were appointed and medical staffs, graduate nursing staffs and ward personnel were increased; graduate dietitians were employed; occupational therapy departments were established or re-established and trained librarians secured for promoting bibliotherapy; an active state-wide training program for nurses and attendants was instituted; social service departments were added and a beginning was made in the organization of outpatient clinics.

A further step in central administration was the establishment in April 1943 of the Department of Mental Hygiene and Hospitals. Dr. Henry, director of the State Hospital Board, was appointed by the governor as commissioner to head the new department which will be charged with planning the post-war reorganization and expansion.

Already some notable developments have been brought about. Dr. Joseph E. Barrett, who had served first as clinical director at the Southwestern State Hospital, was made supervisor of outpatient clinics for the Commonwealth of Virginia, and made a beginning by setting up 7 outpatient clinics from the Southwestern State Hospital. These clinics have continued in successful operation. In September 1943 Dr. Barrett became superintendent of the Eastern State Hospital at Williamsburg and plans to organize similar outpatient clinics from that institution as soon as the requisite personnel is available. Eventually it is hoped that outpatient clinics centered in each of the state hospitals will be established, thus guaranteeing a state-wide extramural service.

The building program to be initiated at war's end is impressive. It is proposed to expend between seven and eight million dollars on new construction and improvements. These include an admission building at Southwestern State Hospital, a new building for colored criminal insane at Central State Hospital, extensive remodeling Western State Hospital and replacement of the present plant at Eastern State Hospital at an estimated cost of $3,500,000.

This latter project is of particular interest since, it will be recalled, the Eastern State Hospital at Williamsburg was the first public institution for mental patients in the United States. However, none of the original hospital buildings is in existence. In 1885 the ancient institution was entirely destroyed by fire. The present hospital, rebuilt on the original site is therefore comparatively modern; but it is approaching the end of its unique and honorable career. The new Eastern State Hospital will rise some 3½ miles distant on a tract of 1500 acres known as Dunbar Farms. The hospital owns this land and developments are under way. Indeed certain ward buildings have already been erected and some 400 patients have been transferred to the new location. The planned capacity of the new institution will be 2000 beds.

With the abandonment of the present hospital a site of great historic import will have lost some of its significance. However, the location of the first mental hospital in the

United States will no doubt be suitably and permanently marked.

The developments above outlined and others to follow will require several years. With their accomplishment the Commonwealth of Virginia will take its place in the front rank of those jurisdictions in which state care is cultivated in the best interests of the mentally ill and for the promotion of psychiatry as a medical science.

BERNARD SACHS

The place of high honor and authority held by Bernard Sachs is attested in many ways; in none perhaps more definitively than in volume ix, number 4 (November–December, 1942) of the *Journal of the Mount Sinai Hospital,* New York. This was not an ordinary issue, it was the Sachs Anniversary Number, a tribute symposium of nearly 900 pages, prepared to commemorate his "sixty years of participation in the progress of medicine." But in that statement are summed up many things. The tribute volume commemorated the fact that more than forty years earlier Dr. Sachs had established at Mount Sinai Hospital the first neurological service in any of the large private hospitals of New York City; it signalized his great achievement in organizing the First International Neurological Congress at Berne, Switzerland, in 1931, the proceedings of which he directed as president at the age of seventy-four; it testified to his investigative acumen by reprinting his first paper (published in 1887, five years after his graduation in medicine) on the disease with which his name has since been associated (the Tay-Sachs disease), and to which he later gave the name "amaurotic family idiocy"; it recorded his second term at seventy-five as president of the American Neurological Association, having twice previously served also as president of the New York Neurological Society; and further that at seventy-six he was called to the presidency of the New York Academy of Medicine; it bore witness to his great service to the neurology and psychiatry of childhood ("Nervous Diseases of Children," first edition, 1895; second edition, 1905; "Nervous and Mental Disorders from Birth Through Adolescence" (with Hausman), 1926; "Keeping Your Child Normal," 1936), which culminated in 1936 when the Friedsam Foundation, established by his friend the late Col. Michael Friedsam, made a substantial grant for the advancement of child neurology and Dr. Sachs became director of this research project. (He had already served as director of the division of child neurology in the New York Neurological Institute.)

Bernard Sachs was preeminent as a clinician and as a teacher, by his writings, as chief or consultant in numerous clinics, as professor of clinical neurology in the College of Physicians and Surgeons, Columbia University; he was a promotor and leader in many humanitarian movements; he was a good and well-loved citizen.

As Dean of American Neurology, Dr. Sachs was much more than an accomplished neurologist. His activities in the broader fields of health and welfare as well as in connection with the three International Neurological Congresses are evidence enough of the scope of his vision and purpose. He foresaw neurology and psychiatry drawing still more closely together. As Adolf Meyer pointed out in his biographical contribution to the tribute volume, he sought ever to maintain a balance between neurology and psychiatry, "operative largely in neurology but by no means exclusively so, a physician not merely of physic . . . ." In his own remarks at the testimonial celebration in 1942, commenting on the neurological clinic he had founded at Mount Sinai Hospital, Dr. Sachs expressed the hope "that in order to do full justice to the study of the neuroses and the neuropsychoses and to study them critically without being victimized by any one school of thought, this service may be developed into a neuropsychiatric service, in which organic neurology will always play the important and fundamental role which it holds by right in the latter day development of neurology and psychiatry."

It is to be recalled Dr. Sachs had been a member of The American Psychiatric Association for fifty years, having joined in its

semi-centennial year, and that only three years after the Weir Mitchell philippic he, another neurologist, was invited to deliver the address at the annual meeting in Baltimore. He felicitated the Association for its courage. But his address was of another stripe ("Advances in Neurology and Their Relation to Psychiatry," *Am. J. Psychiat.*, July, 1897), and he established his own psychiatric citizenship by aligning himself with those who "would never have entered the ranks of neurologists if they had not been impelled to the study of nervous affections by a special fondness for the analysis of mental conditions." He conceded that anatomy and pathology and physiology alone had not been able to account for all the disorders of mental function, but he warned that there were pitfalls in "the more or less speculative field of morbid psychology." The closing note of that 1897 address was one of encouragement and prophetic: "The past of psychiatry has been full of discouragement; the present is involved in a maze of uncertainty, but the future is full of hope." That note of wholesome optimism characterized Dr. Sachs to the end of his career.

Forty-five years after the Baltimore meeting Dr. Henry Riley spoke at the testimonial gathering in New York of Dr. Sachs, Founder of the International Neurological Congresses. The third Congress was held in Copenhagen, Aug. 20-25, 1939, just as the German horror was about to descend upon Europe. The fourth Congress was to have been held in Paris in 1943. Dr. Riley expressed assurance that the movement initiated by Dr. Sachs would continue and that the series of Congresses would be resumed. "It is to be hoped," he said, "that this resumption of the discussion of communal interests may emerge in a saner, wiser and more self-understanding world, and that the American neurologist who will again serve as the leader in this field of scientific endeavor will be Dr. Bernard Sachs."

In an altered sense it will be so.

C. B. F.

NEWS AND NOTES

ROYAL MEDICO-PSYCHOLOGICAL ASSOCIATION.—In a memorandum issued by the Royal Medico-Psychological Association various recommendations are made for developments and improvements in the mental health services on a national scale. In this fairly comprehensive report two points may be selected for emphasis:

1. The Association maintains firmly its position that the medical superintendent of each mental hospital should be in complete charge of his institution; it is unalterably opposed to any plan for dual authority with a business manager and a medical director more or less independent of each other.

2. The need of psychiatric services in general hospitals is recognized. The report suggests that 6 per cent of the total bed accommodation should be allocated for psychiatric cases, such "units" being staffed by psychiatric nurses.

MICHIGAN SOCIETY OF NEUROLOGY AND PSYCHIATRY.—The programs of the Michigan Society of Neurology and Psychiatry for the current year have all been related to the present military emergency. At the meeting held on September 23, 1943, Dr. John C. Whitehorn, Henry Phipps Professor of Psychiatry at the Johns Hopkins University School of Medicine and Psychiatrist-in-Chief at the Johns Hopkins Hospital, Baltimore, Maryland, addressed the Society on "Individual Issues in Post-Military Psychotherapy." On November 30, 1943, the Hon. Walter S. Maclay, Medical Superintendent of the Mill Hill Emergency Hospital, London, England, spoke on "Neurotic Disabilities in a Total War: The Rehabilitation of Neurosis Cases" and showed films of the work being carried on at the Mill Hill Hospital. On January 20, 1944, Dr. Raymond W. Waggoner, Professor of Psychiatry at the University of Michigan Medical School and Psychiatric Consultant to the Selective Service System, spoke on "Selection, Rejection and Rehabilitation: Our Psychiatric Responsibilities." The March meeting of the Society will be devoted to a consideration of the problem of juvenile delinquency.

BOSTON PSYCHOANALYTIC SOCIETY.—The educational committee of the Boston Psychoanalytic Society announces that in applying the minimal standards of the American Psychoanalytic Association it will in the future require that all candidates shall complete at least the following courses:

Supervised analyses: 2 cases completed to satisfaction of control analyst and educational committee.

Didactic courses: 1. Clinical: a. Group control, b. Case discussion seminar.

2. Theoretical: I. General introduction. Theory of instincts, neuroses and anxiety, dreams, technique, neuroses, the ego.

II. Psychoanalysis and psychiatry.

III. Selected writings of Freud.

IV. Applied analysis four lectures.

The courses required marked "R" and elective for 1943-44 are as follows: (R) Group Control Seminar: Dr. Greta Bibring; (R) Discussion of Cases: Dr. Ives Hendrick; Special Clinical Problems: Dr. Helene Deutsch and Dr. Lucie Jessner; Theoretical and Clinical Problems of Children and Adolescents: Mrs. Beata Rank and Dr. Marian Putnam; (R) Theory of the Neuroses and Anxiety: Dr. Hanns Sachs; (R) Psychoanalytic Technique: Dr. Edward Bibring and Mrs. Beata Rank; (R) Psychosomatic Problems: Dr. Felix Deutsch; (R) Theory of Psychoses: Dr. Frank C. d'Elseaux.

Seminars for social workers and nursery school teachers are as follows: Problems of feminity with emphasis on the influence of the war: Dr. Helene Deutsch; Psychological problems of case work: Dr. Greta Bibring and Dr. Julia Deming; Psychoanalytic contributions to medical case work: Dr. Jacob Finesinger; Discussion of child problems in social work: Dr. Robert Young; Discussion of nursery school problems: Dr. Julia Deming.

DIETETIC COURSE AT COLORADO STATE HOSPITAL.—The Colorado State Hospital at Pueblo has an outstandingly good dietetic organization. Dr. F. H. Zimmerman has now set up a graduate course in dietetics lasting twelve months. The required work is so designed as to make the student eligible for membership in the American Dietetic Association. Those who take the course must already have a Bachelor's degree with suitable credits in foods and nutrition or institution management. Work will be given not only at the State Hospital but also in two general hospitals in Pueblo, these affiliations totaling three of the twelve months. Detailed information can be obtained from the chief dietitian of the Colorado State Hospital.

DR. ARNILLAS' MISSION TO CHILE AND THE ARGENTINE.—A dispatch from Santiago, Chile, reports that the distinguished Peruvian psychiatrist, Dr. José Max Arnillas, visited that city on commission by his Government officially to present diplomas of honorary membership in the Peruvian Society of Neuropsychiatry to the Chilean delegates to the Panamerican Conference on Neuropsychiatry held in Lima in 1939. The presentation took place Dec. 30, 1943, at a special meeting of the Chilean Society of Neurology, Psychiatry and Legal Medicine, of which Dr. Arnillas is an honorary member.

The Chilean delegates upon whom this honor was conferred were Dr. Baldomero Arce Molina, Dr. Juan Garafulio, Dr. Isaac Horwitz, Dr. Alfredo Rojas Carvajal and Dr. Arturo Vivado.

Before proceeding to Santiago, Dr. Arnillas, ex-president of the Peruvian Medical Association, had just completed a similar mission in Buenos Aires.

ASSOCIATION FOR RESEARCH IN NERVOUS AND MENTAL DISEASE.—The twenty-fifth annual meeting of the Association for Research in Nervous and Mental Disease will be held in New York in December 1944. The program for this meeting will center around the general topic of military neuropsychiatric conditions. The following officers were elected for 1944: President: Dr. Franklin G. Ebaugh. First Vice-President: Dr. Harry C. Solomon. Second Vice-President: Dr. Titus H. Harris. Secretary-Treasurer: Dr. Thomas E. Bamford, Jr.

THE PSYCHIATRIC EDUCATIONAL SOCIETY, BERKELEY, CAL.—This Society has been organized recently in Berkeley, with a two-fold purpose, "first, to provide opportunities for education for the younger psychiatrists in the armed forces; and second, to provide a common meeting ground for military and civilian psychiatrists."

The program calls for bi-monthly meetings, at each of which one paper will be presented for discussion by the group.

Dr. Karl W. Bowman, director of the Langley-Porter Clinic, San Francisco, is president of the Society and Dr. J. Kasanin, head of the psychiatric service, Mount Zion Hospital, San Francisco, is in charge of the educational program.

COURSE IN RORSCHACH TEST.—Michael Reese Hospital announces its 1944 course in the Rorschach test to be conducted by Doctor S. J. Beck.

The emphasis this year will bear especially on the test insofar as it indicates expectation of success in treatment. The teaching material, as in former years, will consist of Rorschach response records as obtained from patients under observation and treatment. These will be evaluated and interpreted. Clinical groups sources will be neuroses, and early or latent schizophrenia.

The dates are June 5-9, inclusive; two sessions daily, two hours each session. For information write to Department of Neuropsychiatry, Michael Reese Hospital, 2815 Ellis Avenue, Chicago 16, Illinois.

OPENING FOR PSYCHIATRIC SOCIAL WORKERS.—The Los Angeles Psychiatric Clinic, a Community Chest adult psychiatric clinic, is in need of a senior or chief psychiatric social worker. The salary for the position is $3,600 to $4,000 a year. There is a possibility that positions for two assistant psychiatric social workers will also be available. The salary for these would be $3,000 a year. Persons interested kindly communicate with Dr. Eugene Ziskind, Director, 1306

North Berendo Street, Los Angeles 27, California.

NATIONAL VOCATIONAL REHABILITATION.—The establishment of eight regional offices to facilitate nationwide rehabilitation service under the Barden-LaFollette Act has been announced by Federal Security Administrator Paul V. McNutt. Director of Vocational Rehabilitation Micheal J. Shortley says: "Regional representatives will assist the states in preparing state plans so that they may qualify for the Federal grants now available, and will aid the states, at their request, in expanding state vocational rehabilitation programs."

The new law provides for a variety of therapeutic as well as vocational services, covers additional groups of disabled civilians and authorizes more Federal participation in financing state rehabilitation programs. The regional offices and regional representatives of Vocational Rehabilitation are as follows:

Region I.—Connecticut, Maine, Massachusetts, New Hampshire, New York, Rhode Island, Vermont: Mr. Homer L. Stanton, Rochambeau Building, 815 Connecticut Avenue, N. W., Washington 25, D. C.

Region II.—Delaware, District of Columbia, Maryland, New Jersey, Pennsylvania, Virginia, West Virginia: Mr. Irwin M. Ristine, Rochambeau Building, Room 107, 815 Connecticut Avenue, N. W., Washington 25, D. C.

Region III.—Alabama, Florida, Georgia, Mississippi, North Carolina, South Carolina, Tennessee, and Puerto Rico: Mr. Heber B. Cummings, 441 W. Peachtree Street, Atlanta 3, Georgia.

Region IV.—Illinois, Indiana, Kentucky, Michigan, Ohio, Wisconsin: Miss Tracy Copp, Bankers Building, 105 West Adams Street, Chicago 3, Illinois.

Region V.—Iowa, Minnesota, Nebraska, North Dakota, South Dakota: Mr. John R. Lasher, Room 438, Midland Bank Building, 4th Street and 2d Avenue, Minneapolis 1, Minnesota.

Region VI.—Arkansas, Kansas, Louisiana, Missouri, New Mexico, Oklahoma, Texas: Mr. R. Doyle Best, 414 Dierks Building, 1006 Grand Avenue, Kansas City 6, Missouri.

Region VII.—Colorado, Idaho, Montana, Utah, Wyoming: Mr. Harold C. Corpening, Room 345-47, Equitable Building, Denver 2, Colorado.

Region VIII.—Arizona, California, Nevada, Oregon, Washington, and Hawaii: Mr. Frank J. Clayton, Room 1001, Humboldt Bank Building, 785 Market Street, San Francisco 3, California.

POSITION IN CHILD PSYCHIATRY AVAILABLE.—There is an opening for a psychiatrist specializing in child behavior problems in the clinic of the Cuyahoga County Juvenile Court at Cleveland, Ohio, of which Judge Harry L. Eastman is the head. This is a full time position and will carry a salary of $5,000 or better a year, depending on the training and experience of the applicant selected. In addition to the regular service functions, the position offers exceptional opportunities for original research. The clinic consists of a psychiatrist, a psychologist and a physician all employed full time and working cooperatively. Interested psychiatrists should communicate with M. S. Laird, Director of Research, Cuyahoga County Juvenile Court, 2163 E. 22nd St., Cleveland 15, Ohio.

SAFEGUARDING MILITARY INFORMATION

It is essential for the quick winning of the war that every man, woman, and child be on the constant alert against enemy sabotage.

The enemy, with agents in all sorts of unexpected places, such as near the scene of an accident, at the doctor's office, in a home to which the doctor or nurse may be called, at an open meeting of association or club, has its ears constantly open for even seemingly innocent bits of information about the fighting forces. Piecing little bits together is a precision art with them.

To be on the safe side—to safeguard all military information—think first, before you spread the word that may mean death to our men and destruction to our plans.

When your patients become talkative, remind them, too! No one can be hurt by things left unsaid.

BOOK REVIEWS

MIND, MEDICINE, AND MAN. By *Gregory Zilboorg*. (New York: Harcourt, Brace and Company, 1943.)

On the whole, this book is a praiseworthy contribution. It leaves no doubts about the author's admiration for Freud's contributions, or about his evaluations of the social and scientific significance of psychoanalytic thought and practice. In justifying his points of view respecting the latter, perhaps Zilboorg has, here and there, spiced his discourse too strongly with positive assertions. This may cause the book not to be equally palatable for all readers.

The reading of this or any other book, however, constitutes a communication from one person to one other person, and with it an interaction between book and reader, who tends to find in what he reads some reflection of himself, his wants or needs. This review, therefore, represents such an interaction.

In general, the more salient features of this volume are the following: First, that mind and body as an organic unity fit within a biological framework wherein the nature of man cannot be excluded from nature as a whole. Second, that mind is not something capable of dallying at large in independent fashion. It embraces in part a personal awareness of what is going on about or within us, and this is solely an individual experience which must be accepted as a natural phenomenon. Third, that this natural phenomenon has discoverable relationships with many things, with phases of life experiences of which we are aware and also those phases or connotations of experiences of which we are unaware; with drives fundamentally inherent in the energies of human living that are unconcerned with conscious esthetic and ethical ideals; with desires, wishes and ambitions; with what one works for, what one wants and what one thinks and feels about all of these. And fourth, that the cause and effect relationship of these can be and are being investigated, studied and evaluated scientifically, since the study of relationship is the basis of all scientific method. All we know about anything is its relationship.

Some of the other important features of the book may be enumerated. For example, the ghosts of spiritualism have not been fully exorcised from medicine, and medical practitioners and medical educators must know the significance of emotional factors in illness and how to deal with them appropriately if medicine is to fulfill its obligations; that mental illnesses are not a series of disease entities but rather a disordered functioning of a total personality; that the goal of psychotherapy, by dealing directly with a patient's psychological conflicts, involves a proper reconstruction of the psychic economy in the direction of realistic functioning. It is not a series of clever deceptions to be practiced on patients or a system for the mere removal of offensive symptoms. Neither is it a method for manufacturing happiness or a means for promoting a philosophy of life.

The author gives meaning to the more fundamental physiological and biological demands for living, in terms of their general relationship to the thoughts, feelings and acts of man. Unlike other pens that have written about the "untamed vipers" in man, as though these were new discoveries, Zilboorg's pen brings the reader to realize the significance of the more gentle and esthetic aspects of life resulting from their domestication, and to better appreciate some of the difficulties and pitfalls encountered in bringing this about, for "man's animal nature" is not a separate entity.

The book purports to represent an effort for better acquainting lay readers with the subject matter of mind, medicine and man. To accomplish this is not the most simple of tasks, for many misevaluations arise out of social heritage and from the mosaic of one's individual experiences of living. Many misconceptions must be overcome before accurate knowledge can become acceptable.

The author, being not unfamiliar with medical history, reviews the significance of our social heritage in terms of world civilized opinion and its relationship to the birth and development of medicine and of psychiatry. The development of psychiatry, while influenced in part by a succession of historical events creating a more profound respect for the individual, has, nevertheless, experienced a cultural lag in terms of a scientific approach toward the understanding of things called "mental" or "mind." He thinks that Freud's contributions blazed the way to this approach.

It is apparent to most psychoanalysts and many others, that as living persons we have no positive knowledge about the Freudian divisions of psychic structure. The "id" is theoretically comparable to the aggressive, untamed or unscrupulous qualities of mind, or regarded as sordid "human nature." The "super ego" is the esthetic and temperamental scold, or the nagger and exactor. Neither of these in theory serves as intermediary with the world of reality; only the "ego" performs that function, and in doing so may not represent itself but rather obey the "bold, bad, wicked" and insistent "id," or even the scolding or exacting voice of the "super ego." The appropriate integration of these three elements, in terms of a working agreement against the humiliating hurts of living, probably constitutes what Aristotle called the "over-all aims" and objectives of the body or the human personality functioning as a whole.

No matter what one may think of these concepts, it may be well to consider that modern biology has been of a very special kind from its beginnings, even to the point, perhaps, of producing in some quarters a kind of "rodent specialism" as a scholarly or scientific attainment. Modern biology, however, has been alien to "the sweeping explanations" and

"the ultimate accountings" that seem to constitute philosophy.

Little credit is given for the debt our modern world owes to early Greek biology and medicine. The scientific spirit was an endowment of Hellas, and alien from the genius of Rome. Greek biology presents penetrating descriptions and these were such as yielded explanations. The "why" was always lurking or pressing unconcealed behind the "how" and even instigated it. It was then that the natural phenomenon or principle of cause and effect relationship became established. The lesson and example of this approach, free from superstitious fear, admitting of no magic, recognizing no supernatural, and devoid of religious awe, built up a systematic body of natural knowledge which has never ceased to be the inspiration of the scientific world. The use of these principles by Freud and by psychoanalytic thought and practice in the field of psychological medicine, appears to be the main thesis of this work.

W. L. T.

ROOTS OF BERGSON'S PHILOSOPHY. By *Ben-Ami Scharfstein.* (New York: Columbia University Press, 1943.)

The thesis of this book is expressed in the title of the last section, "Is Bergson Original?" The conclusion is that he made a harmonious "system," a "terminal system, one that characterizes a trend in the history of thought" and "his philosophy is the final result of a convergence of ideas" (p. 136). This is a judicious decision which emerges from the preceding sections on the different periods and aspects of Bergson's philosophical development. It is a decision in harmony with the whole range of philosophical achievements, for the function of reflective thought is to survey, synthesise and interpret the ideas which have gradually developed and finally undermined the previous interpretations of experience. The value of a philosophy, consequently, does not depend wholly on either its originality or its finality, but rather on its adequacy to the task of recognizing and assimilating what is revealed in the time-process. For the same reason it is an error to confuse research into the antecedents of a philosophy with accusations of plagiarism, though the error is not always avoided.

The work of Scharfstein is a careful and well documented account of the various currents of thought running through the earlier part of the nineteenth century. It is true that "taproots of Bergsonism have grown from the nourishing Hellenic soil" (p. 5), and a complete record of sources would have to give adequate place to Aristotle and Plotinus. These are indeed mentioned, but the author purposely limits himself "to the immediate scientific and philosophical environs of Bergsonism." In fact such was the erudition of Bergson that without this limitation a study of "roots" might well grow into a history of philosophy. To avoid this it is legitimate to go back no further than the major crisis of the nineteenth century which occurred when all the traditional foundations of rationalism were attacked. For different reasons the mechanistic ideas of the eighteenth century and the absolutism of Hegel both lapsed into disfavour: when even the geometry of Euclid could be relegated to the position of an alternative hypothesis and the laws of nature described as statistical probabilities, the time was ripe for a new picture of reality and experience. The emphasis was no longer on transcendence and timeless reality: time, motion, change and free will were the keynotes of the new themes. The first of the "roots" which Scharfstein traces is time: the second is the concept of intuition, which is really the experience of time. From this the next step is to psychology; where emphasis is laid on the French contributions to psychiatry and particularly to the problems of aphasia (p. 69): thence to biology and Bergson's final work on morality and religion. Bergson was the product of that French system of education which from the time of Napoleon was based on the sciences. But before 1880 the biological sciences had received a great impulse from Lamarck and Darwin, while later the Newtonian physics was to expand into the doctrine of relativity. We find Bergson at first occupied with time as a biological rather than a mathematical category and consequently writing a psychology which emphasises the flux of events and the depths of experience: at a later stage he acclaims the doctrine of relativity because it too gave a new significance to the time factor. It is because the roots of Bergsonism are so closely entwined with the most significant novelties of his generation that his work is inevitably one of the landmarks of philosophy. The immediate contacts with other thinkers from Schopenhauer to James cannot be enumerated here: they form the essential contribution of Scharfstein's book. Perhaps the best estimate of Bergson is that he provided a constructive criticism of the philosophy which prevailed in his youth and left to his successors the task of assimilating the implications of the new movements in biology, physics and metaphysics. A dramatic note is introduced at the end when Bergson contemplated his own transition from Judaism to Catholicism. This might be more correctly interpreted as a progress from philosophical to religious mysticism, but in any case it left unsolved the problem of reconciling the philosophy of change with the fundamental doctrines of Catholicism. In collecting and arranging the material for a study of Bergson's intellectual environment the author of this book has made a contribution to the study of Bergsonism which has distinctive value.

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INTRODUCTION TO PSYCHIATRY. By *W. Earl Biddle, M. D.,* and *Mildred Van Sickel, B. S., R. N.,* with a foreword by *William C. Sandy.* (Philadelphia and London: W. B. Saunders Company, 1943.)

This book is intended to give a simple, clear formulation of the principles of psychiatric nursing and psychiatry for nurses and attendants. The whole book is carefully written for this group. The language is such that one without a high degree of education or much knowledge of the subject will

be able to understand it. Specific directions are given for various procedures and, while these are not in great detail, they are adequate for a work of this type. The book is above all practical.

Little or no space is given to controversial theories, the attempt being to tell the new attendant or nurse as definitely as possible the things he or she should know. The book is well organized, starting out with specific information about the organization of mental hospitals, the attitudes to be taken by nurses and doctors toward mental patients, specific instruction about the care of the patient, and special psychiatric problems and psychiatric treatment generally. Following this is a description of mental disorders. The book fulfills the purpose for which it is written and as such can be thoroughly recommended. As would be expected, the attempt to make everything simple and clear leads to a number of dogmatic statements and some highly controversial subjects are perhaps over-simplified. This, of course, is inevitable in such a book and it can be said that the authors have probably done as good a job in avoiding these dangers as is possible.

K. M. B.

INTRODUCTION TO GROUP THERAPY. By *S. R. Slavson.* (New York: Commonwealth Fund, 1943.)

The material in this interesting book is the result of several years of experience in group therapy with children presenting different types of behavior difficulties. It represents an attempt by a number of trained workers, under the auspices of the Jewish Board of Guardians of New York, to find a method of treating "selected cases" on a group basis, and has been under the direction of the author.

This book is a good addition to the scanty although increasing literature on the subject of group therapy. The author and his staff state their methods, freely illustrated by case material. They make it clear that a careful selection of cases is necessary if their system is to succeed, and try to eliminate the over-aggressive children who need individual therapy before they can be included in the group. The principle of permissiveness probably works best with children already over-submissive in their reactions to adult authority.

The leaders encourage maximum group responsibility for their programs and advise a minimum of leader interference. The individual child thus relates more to the group than to the leader who fulfills the rôle of a "catalyst." Social experience for the individual is stressed and herein lies the main value of group work.

The book raises several theoretical questions which apply both to group and individual therapy. The necessity of a positive relationship with the therapist is stressed as fundamental but the means of acquiring this relationship are open to question. The author places great stress on the "permissive" attitude of the adult. The child is not to be prevented from doing as he wishes and thus the child is shown the "unconditional love" of the leader. Gaining a positive relationship with a child on such a basis seems very questionable. There is less reality in a relationship where a child is permitted to do anything he wishes and I would question if a child could have much lasting respect for an adult who passively allows this.

I would question also the thesis that a group leader "loves" all the children in a group. A therapist can and should respect the individuality of a child, and this basic attitude is essential. But this is very different from loving the child. This may be quibbling about a word but it does seem important to differentiate between love and respect. It is neither possible nor necessary for a group leader, whether he be a therapist or a teacher, to love all children under his care. This asumes that love is a feeling that can be turned on at will by an adult and places no emphasis on the participation of the child in building a relationship in which the feeling of love emerges.

I have questioned some of the theoretical principles, particularly the one which stresses "unconditional love." But the case material brings out a warm understanding of the children, and the leaders are not as passive as the principles say they should be. The fact that many controversial issues are included will make it a good book for those interested in this important aspect of therapy to read. It is well indexed and the Commonwealth Fund has maintained its usual high manufacturing quality.

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LEWIN'S TOPOLOGICAL AND VECTOR PSYCHOLOGY. A DIGEST AND A CRITIQUE. By *Robert W. Leeper.* (Eugene, Oregon: Univ. of Oregon, 1943.)

The purposes of this extensive monograph (218 pages) are, in the author's words: (1) "to give a clear, compact summary of Lewin's conceptual system, and to show how it is related to the tradition of American psychology," and (2) "to suggest some revisions that may be desirable to make this conceptual system more consistent and efficient."

In view of the existence in English of three books and a number of papers by Lewin, and of many articles by his students, it is plain that an exposition of his system is not demanded by virtue of any inaccessibility of sources, even to those who read no German. Leeper believes, however, that Lewin's theoretical writings are very difficult—so difficult, in fact, that "most psychologists have found it impossible to give the time and energy to go through these original, definitive volumes." However little sympathy one may feel for the plight of such psychologists, it cannot be doubted that some students do find Lewin's concepts difficult and strange, at least upon first acquaintance, and that they may on this account refrain from further study. For such students an easy introduction might be valuable; and Leeper's success in his first objective must in the end be judged by their experience with his monograph. The descriptive material appears to be correct and orthodox; this is vouched for, in addition, by the fact that Lewin, himself, raises no objections along this line in a foreword which he

has written for the monograph. It is the reviewer's opinion, however, that novices will still meet many difficulties. Some of these may be increased by the occasional intrusion of critical matter into expository passages. They may also feel the author's somewhat antagonizing tendency toward "writing down," as expressed in his frequently offhand style, as well as in the superficially facetious tone of certain seriously-intended sections. What they are most likely to miss is the constant stimulation of Lewin's own characteristic insights, which is so basic to the enthusiasm of his followers.

Detailed consideration of the critical and constructive sections, to which nearly two-thirds of the monograph is given over, cannot be supplied in a brief review. The author believes his most important original contributions to be his argument that Lewin's concept of "environmental regions" be restricted so as to include only "activities," instead of the perceived surroundings, etc., and his notion of "direction." Debate on the first of these questions would probably be of little interest except to those who might attempt to use topological representations. The definition of the "direction" of behavior, however, seems to have a wider interest; and one would like to have the opportunity of discussing it both with and without reference to Lewinian views. No doubt Leeper is justified in pointing out that direction and distance are closely related concepts. We should like him indeed, to have managed definitions of direction which depended less upon the undefined notion of the "favorability" of the path toward a goal, and more upon analysis of the concept of distance. However, it might well be suggested (although we do not know whether he would agree) that the ideas of favorability and of distance have so little to distinguish them that in discussing the one, one has discussed the other. Besides these matters, Leeper's criticism of Lewin's treatment of his difficult concept of the "motoric" should be mentioned. His contention that the motoric should be represented as lying between the "life space" and the "foreign hull" which surrounds this, is accepted by Lewin in his foreword, and should help to clarify the use of the concept. Many other matters must be omitted from mention as of interest principally to students of Lewin's ideas.

An extensive glossary of terms and phrases used with special meaning by Lewin and by himself is appended by the author. Since page references to Lewin's use of the terms are provided, this section has value in addition to that of its own definitions.

FRANCIS W. IRWIN, PH. D.,
University of Pennsylvania.

COUNSELING AND PSYCHOTHERAPY. By *Carl R. Rogers*. (New York: Houghton Mifflin Company, 1942.)

Very apparent in recent years have been the growth and expansion of "counseling," carrying it in fact to the dimension of an institution, recognized as applying to all areas of social relations. Actually this growth has been over-fast, outstripping the critically scientific and reflective, and accreting to itself a most heterogeneous group of workers from the standpoint of type, background and training. The appearance, therefore, of this volume by Dr. Rogers, professor of clinical psychology at Ohio State University, attempting scientifically to evaluate, crystallize, systematize and suggest, is as timely as it is welcome and helpful.

Compact and efficiently organized (450 pp.), the presentation is outstandingly comprehensive, direct and practical, lending itself excellently to textbook and reference use as well as constituting a valuable and enlightening discussion of the subject as such. Unquestionably it is a decided step forward in the bringing of order out of chaos in a most important field of function.

The central thesis is the formulation of counseling in terms of emphasis on the person rather than on the specific presenting problem. As Dr. Rogers puts it, the approach is "client-centered" in contrast to purely "directive," "ordering and forbidding," exhortatory, reassuring, "advising," and other forms which have found, and still find, wide usage. Its aim is, as far as possible, to have the client work out his situation personally, autonomously, as opposed to being "told," with full opportunity for the release or working out of affect and focus on the achievement of insight. Fundamentally, the objective is the initiation and development, in the frame of a special professional relationship, of a process of personal growth and integration in which the counselor, in addition to guiding and interpreting, serves a vital catalyst function. Respecting the above, of course, psychiatrists would generally agree.

The presentation is made all the more effective through the abundant use of case excerpts, supplementary and explanatory notes, and chapter summaries. Respecting the former, the author is especially fortunate in being able to draw upon a large series of full electrical phonographic recordings. This device, incidentally, as developed by Dr. Rogers, has not only been invaluable in the preparation of this book, but reveals itself also as a most important technical advance with respect to interview analysis, development of method, research, and teaching and training. Of especial interest is Part IV, consisting of the complete and fully annotated transcription of an entire case experience, adding strikingly the highlight of concreteness to the author's approach and conclusions. For a more specific impression of coverage, the following list of chapter heads may be useful: The Place of Counseling, Old and New Viewpoints in Counseling and Psychotherapy, When is Counseling Indicated?, The Creation of a Counseling Relationship, The Directive versus the Non-Directive Approach, Releasing Expression, The Achievement of Insight, The Closing Phases, Some Practical Questions, The Case of Herbert Bryan.

While primarily pertinent, of course, to contacts not outstandingly clinical psychiatrically, the volume nevertheless has much of value for the psychiatrist, and particularly for psychiatrists engaged in child guidance work, school and college mental hygiene, industrial personnel work and related

fields. In short, although naturally not constituting the complete or final answer, it does impress the reviewer as a very real and provocative contribution to an important and rapidly developing work, providing a greatly needed appraisal and much helpful suggestion. And as such, this book is strongly recommended to all professionally concerned with interpersonal relations.

T. R.

CONVULSIVE SEIZURES. By *Tracy Putnam*. (Philadelphia: J. B. Lippincott Co., 1943.)

Whenever scientific interest in any disease condition is intensified and progress is made, the public soon becomes aware of it and demands some knowledge in a language which it can understand. This has been demonstrated in the fields of tuberculosis, cancer, syphilis and mental disease. The public being made aware of advances in these fields, has come to our aid, and has been of great assistance to us, not alone in promoting educational efforts but in furnishing financial assistance for further study.

Epilepsy, because of its protein manifestations, has not been brought into the open as have other conditions. It has always spelled horror, and its many times tragic picture has added to this attitude of mind. However, the increased consideration of epilepsy by scientific workers in a large number of clinics, has brought convulsive disorders to the attention of many. As a result there is a demand for more information, for more knowledge regarding this peculiar disease. This demand was met by the publication about two years ago of "Science and Seizures" by Lennox. Now we have "Convulsive Seizures" by Tracy J. Putnam, professor of neurology at Columbia University and chief neurological surgeon at the New York Neurological Institute. Prior to his removal to New York, Dr. Putnam was a member of that group in Boston which did so much to advance our knowledge of convulsive disorders. He has now presented "A Manual for Patients, Their Families and Friends." This is an unusually well written and informative work, not alone for patients but well worth reading by everyone concerned with the epileptic. It is written in a language which can be well understood by the layman, information not alone for the patient but his family and friends. There is an optimistic vein and a feeling of hope and assurance given throughout this volume. Of special importance is the chapter dealing with the medico-legal implications relative to a clearing up of the "rather chaotic conditions in many states."

The eight "common sense" rules suggested by Dr. Putnam should be a part of everyday therapy with the convulsive case. It is most pleasing to some of us that Dr. Putnam titles this very valuable book "Convulsive Seizures" rather than "Epilepsy."

G. KIRBY COLLIER, M. D.,
Rochester, N. Y.

A HANDBOOK OF PSYCHIATRY. By *P. M. Lichtenstein* and *S. M. Small*. (New York: W. W. Norton & Company, 1943.)

This is a handbook prepared for students of psychiatry and other persons who are brought into contact with mentally ill patients. It is written in a clear and straightforward style with a minimum of technical language. The material is arranged in a traditional order. There is an introductory discussion of normal personality functioning and of abnormal behavior. This is all too brief and does not stress sufficiently the unconscious aspects of mental life.

In the chapter on psychometric tests, there is no mention of personality testing, Rorschach, or of educational tests. We were disappointed in the chapter on psychopathic personality, probably because we expected so much from one of the authors who deals extensively with these problems.

It is interesting to see chapters on war psychoneuroses and psychosomatic illness.

One cannot quite agree with some of the authors' statements, such as the necessity for continuing hospitalization of paranoid schizophrenics despite improvement. There are some inaccuracies, such as the statement that alcoholic hallucinosis occurs as a sequel to acute alcoholic delirium. The treatment of delirium tremens is somewhat antiquated when lumbar taps are recommended to relieve increased intracranial pressure. The recent work in this field certainly negates such suggestions.

The best parts of the book are the last two chapters in which are discussed general principles of psychiatric therapy and therapeutic aids. Various nursing procedures are described in some detail, and techniques given for the care of the patient.

This book may be recommended for the psychiatric nurse and social worker—it is not complete enough for the medical student.

S. BERNARD WORTIS, M. D.,
Bellevue Hospital, New York, N. Y.

PRINCIPLES AND PRACTICE OF REHABILITATION. By *John Eisele Davis, M. A., Sc. D.* (New York: A. S. Barnes and Company, Inc., 1943.)

This is a timely book. The author makes good use of outlines and repetition to drive home the salient points of achieving mental health through balanced living in a mental hospital. The program of recreational activities, occupational therapy, music and dancing should never become routine. The individual and individual differences should be kept in mind. Authorities in the fields of psychiatry, psychology and education are quoted freely. The needs of the individual are stressed. The case histories are excellent. To all workers in the field of treating and restoring mental patients, this book can be recommended. It should help to make the work of the therapist more effective and satisfying through an intelligent understanding of this subject, whether during times of war or peace.

JAMES H. WALL, M. D.,
New York Hospital, Westchester Division,
White Plains, N. Y.

NEUROLOGY. By *Roy R. Grinker*. Third Edition. (Springfield, Ill.: Chas. C. Thomas, 1943; Toronto, Can.: The Ryerson Press, 1943.)

The third edition of this well known textbook presents a rearrangement of material and forms in many ways an improvement, in other ways less obviously so.

The chapters on "The Extrapyramidal System"; "The Inflammatory and Infectious Diseases"; "The Cerebrospinal Vascular System and Syphilis of the Central Nervous System" are excellent, while the chapter on "Brain Tumor" by Paul C. Bucy is extraordinarily complete for a student textbook.

On the other hand, the substitution of the chapter on "The Myopathies" for that of "The Atrophies" of the earlier editions is not so well chosen.

Under this heading are described the neuropathic atrophies along with the myopathies which tends to confuse the pathological issue in the mind of the student.

The laudable attempt to correlate all the available neurological data with recent physiological and biological hypotheses has crowded into its one thousand pages an amazing mass of factual material—occasionally to the detriment of a more critical analysis of this material.

It may be said, however, that no other textbook of its kind offers the student so extensive a store of easily available neurological knowledge.

An exhaustive bibliography is to be found at the end of each chapter. The selection of illustrations is very complete and appropriate to the text, the style is easy and the printing formation unusually attractive.

FRED H. MACKAY, M. D.,
McGill University.

INFANT AND CHILD IN THE CULTURE OF TODAY. By *Arnold Gesell* and *Frances L. Ilg*. (New York and London: Harper and Brothers, 1943.)

This latest volume among the books from the Yale Clinic of Child Development will be useful in the hands of physicians and all others who have a serious professional or parental interest in the personality development and guidance of normal children. For the child psychiatrist it is invaluable because it provides norms, based on careful observation, essential for the appraisal of behavior deviants.

The volume is divided into three parts. Part I, entitled "Growth and Culture," discusses the interrelationships of maturation and acculturation, of the inner forces of development and the demands of the social order in which a child finds himself. Part II represents the main body of the book and addresses itself to the description of behavior at twelve successive levels from four weeks to five years, thus providing a vivid and instructive picture of development in infancy and the pre-school period. At each age level the achievements and typical performances of the child are summarized in a "behavior-profile" and a "behavior-day." At the higher levels—from eighteen months on—special attention is given to the cultural and creative activities as well as to the rôle nursery school plays in the child's life. The authors emphasize that "the age norms are not set up as standards and are designed only for orientation and interpretive purposes," and that great variations in individual children must be expected. The term culture is used in the present volume in a very wide sense, denoting not only the institutions and material objects in the environment of the child, but also the parents and other persons with whom he has contact and who are to him the representatives of the society of which he will have to become a responsible member.

Part III, entitled "The Guidance of Growth," elaborates on the development of each particular phase of behavior (feeding, elimination, sleep, etc.) through infancy and the pre-school period. It leads up to a discussion of a "developmental" philosophy for the practice of child rearing and child guidance as contrasted against authoritarian principles and the ideas of laissez-faire. This integration of a highly specialized subject into the fundamental questions, underlying today's conflict, makes it a very timely book. The perfect workmanship and the beautiful appearance of the volume do full justice to its contents.

TRUDE TIETZE, M. D.,
Johns Hopkins Hospital,
Baltimore, Md.

THE VERTEBRATE EYE AND ITS ADAPTIVE RADIATION. By *Gordon Lynn Walls*. (Bloomfield Hills, Mich.: Cranbrook Institute of Science, 1942.)

This is a book on comparative ocular biology in three sections, with special emphasis on the structure and function of the retina. The first section deals with the anatomy, physiology and embryology of the typical vertebrate eye. The second is the ecological portion of the book and gives the evolutionary responses of the vertebrate eye to various environmental factors. The third section traces the history of the eye, group by group, from the lowest living vertebrate to the highest. A very wide field has been covered in this volume, but its value to the experimentalist is somewhat lessened by the lack of adequate references throughout the text, and the author's statement that it "has been written in the style of a textbook, though for a course which has yet to be given in any American university," is scarcely sufficient reason for this omission.

Dr. Walls upholds the "duplicity theory" of vision, and he deals with the absorbing but tremendously difficult problem of colour vision in a thoughtful and analytical fashion. He draws attention to the unfortunate use of the term colour blindness to describe a clinical condition which is really colour weakness.

The book is written in a lucid manner and the subject matter is treated in such a way as to stimulate, as well as inform, the reader.

T. H. HODGSON, M. D.,
University of Toronto.

ESQUIZOFRENIA. By *Dr. Carlos R. Pereyra.* (Buenos Aires: "El Ateneo," 1943.)

This monograph of 150 pages is based on the author's personal clinical experience and treats systematically the various aspects of the disability known as schizophrenia, which he finds, in the voluminous writings about it, "has suffered from literary complications." It is refreshing to read this author's comments on the different "schools," on the diverging concepts which if put together make the term schizophrenia practically equivalent to "madness," and to note the suggestions, here and there, of his clinical skepticism of the psychopathological precisionists.

An interesting feature of this work is the fairly detailed review (34 pages) of the evolution of the concepts of dementia precox and schizophrenia from Willis (1672) to Johannes Lange (1942).

As the author points out the diagnosis of schizophrenia rests solely on symptoms. Etiology, pathogenesis and organic pathology are unknown. He accepts Bumke's statement of the actual status of the question: "a destruction of the personality that occurs without known cause in the juvenile years."

Discussed in order are the beginning of the disability, forms of onset, the symptoms exhibited in disorders of sense perception, consciousness, attention, memory, thought processes, delusions, language peculiarities, changes in affect and volition, motor phenomena. There is a page on physical signs and somatic changes, but no attempt to cover the subject, and biochemical findings are not discussed. The discussion throughout is essentially clinical.

The author and his chief, Dr. Gonzalo Bosch, were the first in the Argentine Republic to treat schizophrenia with insulin (1937).

In the present state of confusion as to diagnosis and classification, Pereyra places hope in a closer and more rigid evaluation of the symptoms themselves for narrowing and delimiting the concept of this psychosis of adolescence.

In general the author's view approaches the classical concept of Kraepelinian dementia precox. He makes the terms "dementia precox" and "schizophrenia" synonymous and opposes any attempt to set up schizophrenia as a separate disease form as Claude has done. Because of the diversity of personality types in which schizophrenic symptoms may appear he makes perhaps insufficient allowance for constitutional factors, although he does speak of "predisposing factors of hereditary nature, but not recognizable before the outbreak of the illness."

C. B. F.

IN MEMORIAM

COLONEL ROY DENNIS HALLORAN[1]

1894–1943

Colonel Roy Dennis Halloran, Medical Corps, Chief Consultant in Neuropsychiatry, United States Army, died of coronary occlusion at Walter Reed General Hospital, Washington, D. C., on 10 November 1943, at the age of forty-nine. He is survived by his wife, Hazel, and by two children, Miss Roberta Lee and Pfc. Donald James, of the Army Air Forces.

Colonel Halloran was born at Cambridge, Mass., August 4, 1894, and was the son of John Francis Halloran and Nora Frances Knox Halloran. He received his secondary school education at the Boys' High School, Brooklyn, New York. After graduating (cum laude) from Dartmouth College with the Bachelor of Arts degree, he entered the College of Physicians and Surgeons, Columbia University, from which institution he received the degree of Doctor of Medicine in 1920. Early in his college career Colonel Halloran developed a strong interest in psychiatry. He became a frequent visitor at the New Hampshire State Hospital at Concord. During the summer months he served as clinical assistant at that hospital until his graduation from medical school. In 1920 he entered an internship at the Newark City Hospital in New Jersey. On September 26, 1921, he married Miss Hazel McEnery, who ardently supported him in his career. In 1922 he joined the Department of Mental Diseases by accepting an appointment as assistant physician at the Boston State Hospital, Dorchester Center, Massachusetts. Here he came under the influence of Dr. James V. May, who recognized and encouraged the young physician's administrative and organizing ability. In the short space of six years he rose, through the ranks, to become assistant superintendent of that hospital in 1928. His abilities in the meantime came to the attention of the late Dr. George M. Kline, then Commissioner of the Department of Mental Diseases, who called him as assistant to the Commissioner in 1929. He supervised the organization of the new Metropolitan State Hospital in Waltham, Massachusetts, becoming its first superintendent in 1933. The Metropolitan State Hospital stands as a tribute to him, a crowning achievement of his interest and organizing ability. He was granted a military leave of absence when called to head the newly reorganized Neuropsychiatry Branch in the Office of The Surgeon General.

Early in his medical career he developed an active interest in research. He collaborated in the founding of the research department of the Boston State Hospital in 1925, and with Dr. Abraham Myerson originated the technique for obtaining blood from the internal jugular vein and internal carotid artery. His interest in investigation is attested by numerous publications.

He contributed materially to medical and psychiatric education. In 1929 he was appointed assistant professor in clinical psychiatry at Tufts College Medical School and professor of clinical psychiatry in 1939. In addition to carrying a heavy teaching load at Tufts Medical School, he found time to become cofounder and director of the annual post-graduate seminars in neurology and psychiatry at the Metropolitan State Hospital in 1936. The success of the seminars is attested by the development of similar courses in other sections of the country. His many students will always remember his clear, concise and interesting presentation of the subject matter.

On August 17, 1942, he was called to the service of his country with the rank of Colonel. In his all too brief career as Chief Consultant in Neuropsychiatry, he carried over his civilian abilities and interests. In spite of difficulties, he led the development of mental hygiene units in replacement training centers, the development of the School of

[1] A photograph of Col. Halloran was reproduced in the Sept. 1942 (opp. p. 306) issue of this JOURNAL.

Military Neuropsychiatry, and the assignment of neuropsychiatrists to the staff of each division surgeon. His advice was eagerly sought by other army and governmental agencies.

Colonel Halloran was a Fellow of the American Medical Association, Fellow of the American Psychiatric Association, Councilor and Fellow of the Massachusetts Medical Society, member of the American, New England, and Massachusetts Hospital Associations, Massachusetts Psychiatric Association, New England Society of Psychiatry (past president), Massachusetts Occupational Therapy Association (past president), and a diplomate of the American Board of Psychiatry and Neurology, Inc. He was a member of the Dartmouth Alumni Association, Sigma Phi Epsilon, Alpha Kappa Kappa, Gamma Alpha, University Club of Boston, and served as vice-president and president of the Belmont Rotary Club, Belmont, Mass.

Colonel Halloran was a quiet, dignified man who inspired confidence in all who met him. He carried well his responsibilities and had the knack of penetrating the superfluous to reach the real facts. Selfcenteredness and selfishness had no part in his makeup. Throughout his career he was quick to praise his subordinates and repeatedly acknowledged in public his appreciation of those who worked under him. Diligence in the task at hand was always a characteristic with him. This was particularly true in his army career. Those who were close to him realized the effect of the heavy responsibilities placed upon him even to the detriment of his health. He was a devoted husband and father and, in spite of an extremely full schedule, spent much time in the midst of his family circle.

The many students, physicians, nurses and other hospital folk who served under his guidance were always loyal to him. Many returned to seek his advice, since he was never too busy to take a paternal interest in their professional or personal problems. He was a leader whose influence will be felt for many years to come. His funeral, with full military honors and burial in Arlington National Cemetery was a fitting climax to a brilliant career. He died in his country's service, laboring long and without regard to his health, offering the best he had to give—life itself—to a cause which he considered worthy of such a gift.

MALCOLM J. FARRELL,
Lieut. Colonel, Medical Corps.

PHILIP SMITH, M. D.

1872–1944

Philip Smith is dead. That is the word which went over the wires on the evening of January 9, 1944 and every one who received the message felt that something in him had died too. Philip Smith, for nearly a generation as Chief Medical Inspector, had traveled from one end of New York State to the other making his official visits to public and private institutions where the mentally sick were under treatment. Thus he was known to many over the length and breadth of the State of New York.

Philip Smith was kind and generous. He had an abounding interest in your affairs, never was too busy to give his wise counsel; and the memory of his genial bulk, chatting amiably, recounting amusing anecdotes, inviting confidences, exuding warmth and good humor, will long be remembered. How many younger men he wisely directed will never be known but to the troubles of others he gave a willing ear and sound advice.

And what a medical inspector he was! When he finished the job was done. No one could ever turn over another stone expecting to find anything that Philip had not uncovered. The routine quarterly visits were done speedily and efficiently, but it was when some particularly complicated deviltry was suspected of lurking that he shone especially. Then he sat and probed, gently and painstakingly. When the job was finished everyone knew the smallest fact had been unearthed, its importance properly appraised,

and it was either eliminated as of no importance or it had the place in his report which its weight justified. To him patients, employees, officers and others opened their hearts and minds.

His own private inner life did not comport with his exterior. He had cares, responsibilities and frustrations. Early in his professional life he lost his wife and daughter and he carried the troubles of his relatives. His professional achievements matched neither his desires nor his merits but to the world he presented an exterior of abounding good humor. Only to a few did he express any dissatisfaction with the cards dealt to him. In some respects he did not arrive. For example, he long thought of the retirement which was overdue but the war situation compelled him to put that thought aside and he died in harness. A few days before his death he asked the superintendent of the Brooklyn State Hospital if he might come and stay a few days with him. He was slightly under the weather. He was there only five days, was in no apparent danger at six in the evening and at seven he was dead.

Philip Smith was born November 19, 1872, was graduated at Columbia in 1900, interned at Roosevelt Hospital, entered the New York state hospital service and for 17 years was Chief Medical Inspector of the Department of Mental Hygiene. He was a Captain in the U. S. Army during the first world war. He died January 9, 1944.

These brief biographical facts are what he would have wanted the world to know. What he was, what he did for others his friends know and will long remember.

FREDERICK W. PARSONS.

PRELIMINARY PROGRAM

CENTENNIAL MEETING OF THE AMERICAN PSYCHIATRIC ASSOCIATION

To Be Held at the Bellevue-Stratford Hotel, Philadelphia, Pa., from May 15-18, 1944

Due to war time conditions, it may not be possible to house you at the headquarters hotel, the Bellevue-Stratford. Therefore, please make your reservations through Dr. LeRoy M. A. Maeder, Chairman of the Sub-Committee on Hotels, 206 South 13th St., Philadelphia, Pa. The hotel rates at the Bellevue-Stratford as well as other hotels will run approximately from $3.85-$6.00 single with bath and $5.00-$9.00 double.

Due to the heavy demands on hotel rooms in Philadelphia, a war industry city, it is necessary to stress the importance of double occupancy of hotel rooms in order to accommodate the members attending the Centennial Meeting of The American Psychiatric Association, May 15-18. Therefore, it is urgently requested that you make arrangements for double occupancy or authorize the Committee on Hotels to assign occupancy with another member.

Hotels are responsible to the Government Agencies for the above regulations, as persons having war business in Philadelphia must be accommodated. This is a rule by which the hotels must abide.

Motion pictures of hospital and clinic activities will be shown during the meetings. Besides the films already known to the committee, others are desired. Please communicate with Dr. Howard Masters, The Tucker Sanatorium, Richmond, Va., concerning motion pictures and slides.

Preparations have been made for a very fine display of commercial exhibits in the Oak Room and the Reception Room, which should be of interest to all hospital administrators.

The American Psychoanalytic Association will hold its annual meeting at the Bellevue-Stratford from May 13 to 15.

The American Association on Mental Deficiency will hold its annual meeting at the Bellevue-Stratford from May 11-15.

A registration fee of $2.00 is required by all non-members with the exception of those giving papers "by courtesy" or "by invitation," and the wives and other members of the family of any American Psychiatric Association member. Those in the armed forces who are non-members will be registered at a special fee of $1.00. The registration fee will cover admission to all sessions during the week and will include a badge and a copy of the program.

The Women's Arrangements Committee, under the Chairmanship of Mrs. Madeline Appel, is providing an attractive program.

MONDAY MORNING, MAY 15

Opening Session of the Centennial Meeting

Section I: Historical Background.
Section II: Insulin Shock Therapy.
Section III: Joint Session with the American Society for Research in Psychosomatic Medicine.
Section IV: Disturbances in Sleep.

MONDAY AFTERNOON, MAY 15

Section I: Section on Psychoanalysis. Joint Session with the American Psychoanalytic Association.
Section II: Joint Session of the Section on Psychopathology of Childhood and the American Association on Mental Deficiency.
Section III: Section on Convulsive Disorders.
Section IV: Section on Forensic Psychiatry.

TUESDAY MORNING, MAY 16

Section I: Psychiatry and the United States Army.
Section II: Experimental Studies.
Section III: Organic Studies.

TUESDAY AFTERNOON, MAY 16

Section I: Psychiatry and the U. S. Public Health Service.
Section II: Psychoneuroses.
Section III: Administrative Psychiatry.

TUESDAY EVENING, MAY 16

Round Table Discussions:
Administrative Psychiatry.
Child Psychiatry.
Civilian Utilization of War Fostered Trends.
Group Psychotherapy.
Industrial Mental Hygiene and Psychiatry.
Occupational Therapy.
Psychiatric Nursing: Past, Present and Future.
Psychopathic Personality.
The Military Problem of Malingering.

WEDNESDAY, MAY 17

Centenary Day

Guest Speakers: Brig. G. B. Chisholm, Prof. T. North Whitehead, and Alan Gregg, M. D.

WEDNESDAY EVENING, MAY 17

Centennial Banquet (Formal)

THURSDAY MORNING, MAY 18

Section I: Psychiatry and the U. S. Navy.
Section II: Convulsive Shock Treatment.
Section III: Morale.

THURSDAY AFTERNOON, MAY 18

Section I: Rehabilitation.
Section II: Psychosomatic Studies.
Section III: Miscellaneous.